PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 115, No. 27 Thursday, December 31, 1942 Price Ten Cents

Complete Survey of Wisconsin Forest Lands

State Department of Agriculture Finds More Than Four Million Acres of Potential Forest Land Available—Mills Give Christmas Bonuses—C. G. Parker Addresses Safety Group—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 28, 1942—The heavy drain on Wisconsin's timber due to wartime needs is occupying the state's attention with a view to future replenishment. The land inventory division of the Wisconsin Department of Agriculture has completed a survey under the direction of John S. Bordner which indicates that there are more than four million acres of potential forest land available, most of which is now lying waste. This includes more than 1,300,000 acres of poorly stocked aspen, scrub oak and jack pine, "much of which should be underplanted," the report says. Converted to fully stocked stands of timber, these lands would represent a resource of well over $10,000,000. There would be the added advantage of a greater assured pulp wood supply, and more protection for power flowage.

While Wisconsin's plentiful poplar and aspen have been utilized by pulp mills where possible, even though considered inferior for many grades of paper, these varieties are now subjected to competition for demand. Stumpage has approximately doubled since the war began to provide wood for ammunition boxes, crates and other material needed for the armed forces. Federal authorities found after a survey that Wisconsin possesses more acreage of aspen and poplar than any other variety of timber, and seized upon it as a partial solution for the war emergency, because of the central location and accessibility of this timber supply. A number of sawmills have been spared a shutdown by this new market.

Wisconsin will be in the vanguard of the more drastic conservation policies suggested in a recent report of Earle H. Clapp, acting chief of the United States Forest Service, who declared that "developments in the first year of the war bring into focus the inadequacy of the nation's present forestry effort and the threat to the security of rural people throughout our forest regions which is inherent in the current situation." The state legislature will convene in January, and will have before it proposals of the Wisconsin Conservation Commission to enforce selective logging on both public and private forest lands, as well as removal of slash and other protective features to curtail forest fire losses.

Mills Give Christmas Bonuses

Employees of most of the Wisconsin paper mills were given three days of rest by virtue of shutdowns over the Christmas weekend from Thursday night to Monday morning. Many received bonuses or other gifts. At the Badger Paper Mills, Peshtigo, Wis., each male employee with the company more than five years received $25; those with two years or more of service, $17.50, and all others $10. Women workers received $15, $10 and $5, respectively, for the same periods of employment. Among other mills distributing an annual bonus were Gilbert Paper Company, Menasha, Wis., Bergstrom Paper Company, Neenah, Wis., and Central Paper Company, Menasha, Wis. The George A. Whiting Paper Company, Menasha, Wis., gave each employee $10 worth of war stamps, and the Wisconsin Tissue Mills, Menasha, supplied each worker a Christmas turkey.

More than 300 employees of the Neenah Paper Company, Neenah, Wis., enjoyed a Christmas party at Germania hall, Menasha, Wis. An honor roll inscribed with names of employees in the armed forces was dedicated by Leo Schubart, secretary-treasurer. One of those listed, Col. Dan Hardt, a former executive of the company, was home on furlough and spoke briefly. During a dinner, D. K. Brown, president, spoke concerning the wartime difficulties confronting the paper industry. A separate party was held for 200 children of the employees.

The annual Christmas party of the Marinette Paper Company, Marinette, Wis., was held Thursday morning, December 24, at the high school auditorium, carrying out a quarter century tradition of the parent organization, the Scott Paper Company, Chester, Pa. More than 1,300 attended. Older children were guests at a theater party.

Marathon Paper Mills Company used newspaper advertising to extend Christmas greetings. Full pages were published with the heading, "Our Holiday Greetings to Our Home Community," and ap-

(Continued on page 18)

Paper Demand Reported Strong in Chicago

Kraft, Book, Specialties and Other Grades Are Very Active as Heavy Orders Increase Delivery Problem—Salesmen Hold Annual Party—Want Trucking Rates Stabilized—Other Market News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 28, 1942 — With paper production still moving along despite partial curtailment, the local paper industry found plenty of problems in its way for 1943. Many of these were expected to be ironed out at the annual meeting of the paper industry in New York in February but the basic war problems, and methods of solution were expected to linger much longer than that. Demand continues to be excellent with mills as far as thirty to forty days behind in many grades as buyers begin to weigh the unprecedented income of 1943 against their possibilities of finding the goods to make sales. Higher operating costs and heavy taxes will not make the year a good one, actually, but the turnover is there and the industry intact in its desire to prove its essentiality.

Sulphites were reported as strong this week as demand moved upward in virtually all lines. Krafts were strong with an even firmer undertone while groundwoods and newsprint offices also reported plenty of orders and increasing difficulty in filling them. Books made an even better record this week with prices bouncing along on a price ceiling that is developing some real "squeezes" in many instances. Specialties were good and the board market, bolstered by a constant stream of new uses, was also good. Waste papers showed firmness all along the line though with particular reference to the higher grades.

Salesmen Hold Holiday Party

Trimmed of many of its usual frills because of war conditions, the annual Christmas party of the Salesmen's Association of the Paper Industry, was regardless of the trimming, one of the most happy of all the similar occasions held. With the Bal Tabarin of the Hotel Sherman as the scene, the western division pulled together a representative crowd of salesmen and guests to provide an event which really indicated the cooperative spirit of the Association. Courtney Reeves, president, presided, told some good stories and introduced what few impromptu speakers were allowed to take the floor. The only "official" business was the presentation of a War Bond to Ray George of the Tomahawk Paper Company for his work as chairman of the golf committee.

Only formal entertainment was simply the return of two old favorites—Harold Pfister and Harry Kerr —who took the Hotel Sherman piano apart and put it together again and added to the general merriment by their skillful playing. Jim Coy led the singing, this time with his newsly acquired and highly prized lighted baton which sparkled like a beacon light in the otherwise dark recesses of the Bal Tabarin. The only reported difficulty was the strain on Jim in having to keep time when so definitely "on the spot."

It was a "short and sweet" meeting—that one of Monday, December 21, but it served to carry on a precedent, developed a lot of swell fellowship and sent the salesmen into the Christmas season with general appreciation of their being American citizens and members of a great and important industry. Much credit was passed on to Ben Babbitt for his part in perpetuating the annual festive occasion as arranger and master of ceremonies.

B. Crocker New Whitaker Head Here

Bruce Crocker, for a number of years identified with the sales staff of the Whitaker Paper Company, has recently been made vice president of the company and manager of the Chicago office which serves the midwestern territory. He has long been identified with paper selling in this area, beginning back in 1919 with the Paper Mills Company. Early in the "30s" he came with the Whitaker organization only to sever that connection to represent the Crocker, Burbank Company. He now returns to Whitaker in the new executive capacity, working with C. L. Buchanan, who has been manager of the Chicago office since the death of John Hillyer. Mr. Buchanan will continue as a part of the local and regional sales organization.

Transportation Problem More Serious

The transportation problem took a new turn this week as W. E. McCarron, general manager of the Illinois Motor Truck Operators Association, declared that hundreds of Chicago and downstate Illinois cartage companies are in danger of being forced out of business in the coming months unless the intrastate industry is able to get a system of rate stabilization immediately. "Present conditions are steadily nearing the point where the effort expended is no longer very worth the 'return'," declared Mr. McCarron. "There is only way for the intrastate trucking industry to get out of the corner—through a fairer price for its services to the shipping public. Rate stabilization exists in almost every other State and the ICC approves it. Illinois needs it."

Add New Foil Substitute

The Chicago Paper Company and Dwight Bros. Paper Company are among the firms which have recently added a most useful aluminum foil substitute to their representative lines. The new line is a product of the Keller-Dorian Corporation of New York City and looks and feels like aluminum foil and thus provides a timely substitute for a critical material. Reports are the product is meeting with a warm reception.

Addition to Tissue Regulation

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—Standard provisions of OPA price regulations setting forth penalties to which violators are subject has been written into Maximum Price Regulation No. 266-Certain Tissue Paper Products. This addition, correcting an inadvertent omission, is made in Amendment No. 1, effective December 24.

Make Heating and Ventilating Survey at Insulite Plant of M. & O. Paper Co.

By F. B. Rowley[1], R. C. Jordan[2] and C. E. Lund[3]

During the past year the Engineering Experiment Station of the University of Minnesota under a research agreement with the Minnesota and Ontario Paper Company has been conducting a heating and ventilating survey at the paper company's Insulite Plant located at International Falls, Minnesota. The purposes of this survey were to determine and measure all major sources by which heat and moisture are exhausted from the plant and to study possible methods for the conservation of these losses.

The majority of the heat supplied to the Insulite plant is used in the three insulation board drying kilns, and the economical removal of this heat and the accompanying moisture evaporated from the board constitutes a major problem. In addition to the heat supplied to the kilns, some steam is used in the cooking of stocks utilized in the manufacture of insulation board and some for comfort heating purposes. The rapid removal of the moisture evaporated from the board passing through the kilns and from the water sprays and wet stock exposed to the air during processing is a problem of particular importance. Poor moisture removal results in high relative humidities inside the plant, and during the winter months when extremely low outdoor temperatures are experienced because of the northerly location of the plant, condensation of moisture and the formation of fog result from the contact of the warm moisture-laden air with cold air and cold bounding walls. This problem is accentuated during the cold months because of a reduction in the capacity of the ventilation system brought about by the maintenance of a pressure lower than atmospheric inside the plant. This vacuum becomes increasingly greater as the weather becomes colder because the area of the openings through which the outside air is introduced is manually reduced at this time of the year. The methods used in the study of these problems are here classified and discussed according to the source of the loss.

[1] Director, [2] Assistant Director, and [3] Assistant Director, Engineering Experiment Station, University of Minnesota, Minneapolis, Minn.

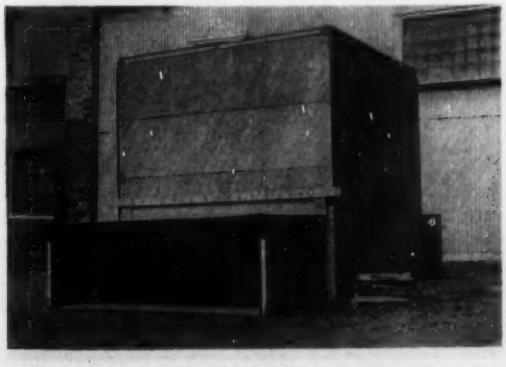


FIG. 1
Test Chamber Used for Determining Ventilator Ratings

FIG. 2
View of Trimmer Saws and Exhaust Hoods at Dry End of Insulite Kilns

Input to Plant

Complete records were made of all steam and electrical energy supplied to the plant in order that check balances of heat input against heat output might be made. All electrical energy supplied for both power and lighting purposes was assumed to be eventually dissipated to the plant as heat energy.

Temperature and Humidity Distribution Within Plant

At the beginning of the survey, a series of locations were chosen throughout the plant at which periodic dry bulb temperature and relative humidity determinations were made. These readings, taken at various seasons of the year and at various points on both the ground and roof levels of the plant, gave a complete picture of the air and humidity conditions encountered during normal operation. This information was used both in the calculation of the heat transmission losses and in studies of the condensation and fogging problems encountered during the cold winter months.

Drying Kiln Tests

Heat and moisture balances were conducted on the drying kilns with measurements made of the heat and moisture input and output on different days. Measurements were kept of the weight, moisture content, temperature, and freeness of all stock entering the kiln during test. Dry and wet bulb temperature measurements were made of all air entering the plant and of all air discharged from the kiln exhausts to the atmosphere. The volumes of air discharged through the kiln exhausts were measured by means of either anemometer or pitot tube traverses. Measurements were also made of all weights of steam or oil supplied to the kilns for heating.

Periodic dry and wet bulb temperature readings

were made of the air exhausted from all roof ventilators and exhaust fans. Because of the design and shape of the majority of these ventilator and fan outlets, it was impossible to make accurate measurements of the volumetric discharge at the time of these temperature readings. However, as this volumetric discharge is dependent upon the pressure or suction head against which the ventilator is operating, records were kept of the building vacuums in order that performance tests might be conducted later under these same conditions. A movable test chamber was then constructed so that any single ventilator might be completely enclosed and subjected to any desired operating head. Typical ventilators were later chosen and subjected to tests in order to determine their complete performance rating comparable to actual operating conditions. These tests were conducted during the summer months when the building vacuum was extremely low, and the differential pressure between the interior of the building and the inside of the test chamber was adjusted by restricting the discharge outlet area of the test chamber. Anemometer measurements were made at the chamber outlets with the pressure differential between the interior of the chamber and the interior of the building adjusted to correspond to the desired building vacuum. The resulting ventilator and exhaust fan performance curves together with temperature measurements taken of the exhaust air during the winter months permitted the calculation of the sensible heat and latent heat ventilator losses for the various conditions of operation.

Moisture Balance

The majority of the moisture discharged from the kiln exhausts or roof ventilators is supplied to the air during the kiln drying processes. However, some moisture is supplied to the air through steam leakage and some through evaporation from water sprays and from open water and wet stock surfaces. In order to get an approximate estimate of the latter source of moisture, a tabulation was made of all open water and stock surfaces and the amount of water supplied through water sprays. Measurements were also made of the water temperatures, the velocity of flow or degree of turbulence, and the surrounding air temperature, and relative humidity. From this information, it was then possible to arrive at a rough approximation of the amount of water evaporated from these sources to the air under normal operation conditions.

FIG. 3
View of Insulite Plant Roof Showing Typical Ventilators

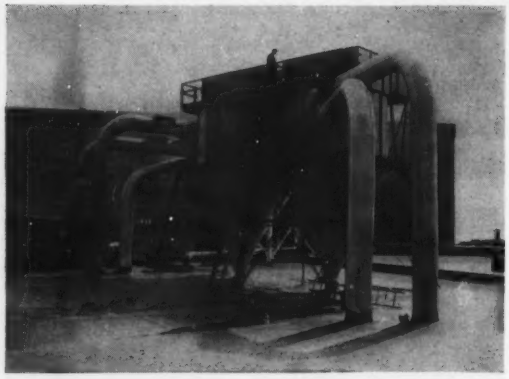


FIG. 4
View of Single-Stage Cyclone Dust Collectors on Insulite Plant Roof.

Cyclone Dust Collector Heat Losses

A considerable amount of dust is created by the cutting and trimming of the insulation board with much of this recovered by the use of two exhaust systems discharging through four cyclone dust collectors. All of the air passing through the exhaust system is discharged to the outside of the building and constitutes a heat loss. In order to determine the magnitude of this loss, measurements were made at several different building vacuums of the volume of air collected by the exhaust system and sent to these dust collectors. Pitot tube traverses were used for the determinations of the air volumes and, together with dry and wet bulb temperature readings, enabled the calculation of the sensible and latent heat in the air discharged to the outside of the building.

Heat Transmission Losses

Analysis was made of the heat transmission losses occurring through the walls, floor, roof, windows, etc., by virtue of the temperature differential across these areas from the inside to the outside of the building. All methods used in the calculation of these sensible heat losses, including the determination of the heat transmission coefficients, were made in accordance with the standard procedure as developed by the American Society of Heating and Ventilating Engineers. These transmission heat losses were determined for the entire range of climatic conditions to which the building is subjected.

White Water Heat Losses

A considerable amount of fresh water is added to the Insulite plant for use in the stock screening processes. This water comes into contact with machinery and stock at a somewhat higher temperature, and in addition, has a certain amount of work performed on it in its passage through the plant. As a result, the water discharged to the sewers is at a higher temperature than that entering the plant and this constitutes a loss of sensible heat. All groundwood pulp used in the manufacture of insulation board is made in a separate grinding room and is pumped to the Insulite plant where it first passes over a stock riffler. This stock enters the plant at a slightly higher temperature than the water discharged from the plant to the sewers, and, therefore, constitutes a net gain of sensible heat to the plant. In addition to these two sources of heat loss and gain in the sewer water, some cooling water from the kiln condensate recov-

ery system is also discharged to the sewers and constitutes a heat loss.

In a previous survey conducted by the University of Minnesota at the Minnesota and Ontario Paper Company's International Falls plant[4] complete volumetric measurements were made of all white water discharged to the sewers by means of a portable wire channel. In the present tests, these data were used together with a series of temperature measurements taken of all sources of water discharged to the sewers at the various points in the plant over a six-months period to determine the magnitude of the net sensible heat loss from the plant through the sewer water. It was found that the temperature rise from the fresh water entering the plant to the sewer water discharged from the plant was approximately constant regardless of the time of year and, therefore, that the magnitude of this loss was not subject to any appreciable seasonable variations.

Basis For Future Studies

The integration of these losses has permitted the formation of a complete picture of the heating and ventilating conditions to be found in the plant with respect to both sensible heat and latent heat or moisture losses. It has formed the basis for future studies concerning the economical recovery of this heat and for the solution of condensation and fogging problems.

[4] F. B. Rowley and R. C. Jordan, "University of Minnesota Conducts Waste Survey at the Minnesota and Ontario Paper Company," Paper Trade Journal, November, 1941.

Strathmore Announces New Officers

The board of directors of Strathmore Paper Company, West Springfield, Mass., announces the following elections: Horace A. Moses to the newly created position of chairman of the board; John D. Zink as president, and as new vice presidents, G. E. Williamson, Arthur E. Shattuck and F. Nelson Bridgham.

Mr. Moses is the founder of the Strathmore Paper Company and for fifty years has directed its destiny, for 45 years as president. He also has many outside business and civic interests. Among them he serves as president of Rising Paper Company, honorary president of Junior Achievement, Inc., president of West Springfield Trust Company, trustee of Boston University and of Wesleyan University, president of trustees of Deerfield Academy, director and member of executive committee of Eastern States Farmers Exchange, honorary president of Hampden County Improvement League.

JOHN D. ZINK

HORACE A. MOSES

John D. Zink joined Strathmore Paper Company as vice president in 1933, retaining his previous presidency of Old Colony Envelope Company at Westfield, Mass. He is also vice-president and director of Premoid Products, Inc., president of the Writing Paper Manufacturers Association, and on the board of governors of the American Paper and Pulp Association, and a member of the Pulp and Paper Advisory Committee of the War Production Board.

In World War I Mr. Zink served overseas as captain in the Tank Corps and in this war has two sons in service.

Strathmore now has four vice presidents: Cassius M. Bryan who for many years has been vice president in charge of production; G. E. Williamson, for several years treasurer and now also vice president; A. E. Shattuck and F. Nelson Bridgham, formerly assistant treasurers and still retaining these positions in addition to being vice presidents.

Union Bag Leases Large Timber Tract

BRUNSWICK, Ga., December 28, 1942—The Union Bag and Paper Company of Savannah, has leased for a period of 99 years lands of the Georgia-Florida Investment Company, located in Charlton county near Folkston. Under the terms of the transactions, which involves an unusually large sum, the company has the option of purchasing the property at the end of seven years, at a price already fixed.

The tract includes 30,000 acres of timber land, saw and planing mills and turpentine operations. The site is two or three miles northwest of Folkston. It touches railroad connections at one point and has a barge landing on the St. Marys river at another, making it possible to ship pulp wood cut on the tract both by rail and water.

This is one of the largest timber deals in South Georgia of the present year, during which there have been some big turn-overs in acreage.

Obituary

Thomas P. Kain

Thomas P. Kain, co-founder and president of the Quimby-Kain Paper Company, Grand Rapids, Mich., and for over 35 years connected closely with the paper business there, died early Sunday morning, December 20, at his home at the age of 58. His death was unexpected, as he had been at his office as usual on Saturday.

Mr. Kain, together with Irving E. Quimby and Miss Anna E. Kirkwood, founded the Quimby-Kain Paper Company in September of 1919. Mr. Quimby and Miss Kirkwood are still associated with the firm. At the time of his death he was president of the Michigan Fine Paper Dealers' Association, a state organization affiliated with the National Paper Trade Association.

He was an active member until his death of several fraternal and religious organizations, among them the Lions Club, Peninsular Club and the Knights of Columbus, in which he held the fourth degree. He was also a member of St. Stephen's Church and the Holy Name Society of St. Stephen's parish.

Surviving are his widow, a son Joseph, a sister and three granddaughters.

James R. Smillie

GOUVERNEUR, N. Y., December 19, 1942—James R. Smillie, 79 years old, for many years a prominent figure in the talc industry, died this week at his home here after a brief illness. He served as superintendent of the International Pulp Company for about 25 years and in a similar capacity for the Uniform Fibrous Talc Company for a number of years. The principal survivors are a wife, a son and two daughters.

Abraham T. Finch

Abraham T. Finch, credit manager for the Alling & Cory Company, paper distributors, 133 West Twenty-first Street, New York, died Sunday at his home, 84-63 Eighty-sixth Avenue, Woodhaven, Queens. His age was 67. He was born in Brooklyn.

Surviving are a son, Robert Finch, and a daughter, Miss Doris Finch.

Louis Astronsky

CHICAGO, Ill., December 28, 1942—Louis Astronsky, secretary and treasurer of the Atlas Paper Company for twenty-eight years, died Thursday in Lutheran Deaconess Hospital. He was 59 years old. He leaves a widow, four sons and a daughter.

H. B. Graves to be General Manager

D. W. Haering & Co., Inc., Chicago, Ill., announces the appointment of Howard B. Graves to the position of general manager of the company. Mr. Graves joined the company in 1934 as senior technologist and was formerly the St. Louis District Manager. His wide background in the chemical engineering field thoroughly qualifies him for the general managership of the company.

Manufacturing facilities of the company were taxed during 1942 and the company is negotiating for additional production facilities for 1943.

Paper Plant Makes New Water Nozzle

From the machine shop of a British Columbia paper mill plant has come a new water nozzle designed to meet the danger of incendiary bombs, declared by Vancouver, B. C., A.R.P. officials to be as efficient as present stirrup pumps and made to cost less than a dollar, will shortly be made available for emergency use in city homes, it is revealed by Provincial Civilian Protection officials.

The new nozzle, engineered and produced by the machine shop department of the Powell River Paper Company at Powell River, B. C., at cost as part of the big paper firm's contribution to Canada's war effort, is designed to fit on the end of an ordinary garden hose and is efficient as long as water remains in city mains.

The new type nozzle is made of scrap brass on hand at the Powell River plant and is now being produced on a non-profit basis which takes in only the cost of the brass scrap and the cost of labor to make them. Plant overhead, including the cost of new tools and machinery is donated by the Powell River Co.

The new-type nozzle will be distributed also on a non-profit basis by the Provincial Civilian Protection Committee under W. C. Mainwaring, chairman, and will be made available to civilians through B. C. department stores and leading wholesale firms at a cost of 75 cents.

The nozzle is less than two inches long and has a precision-machined, but easily operated, 2-valve system which is so designed that the nozzle can throw either a thin stream of water or a scientifically broken-up spray.

Boston Firms Have Christmas Parties

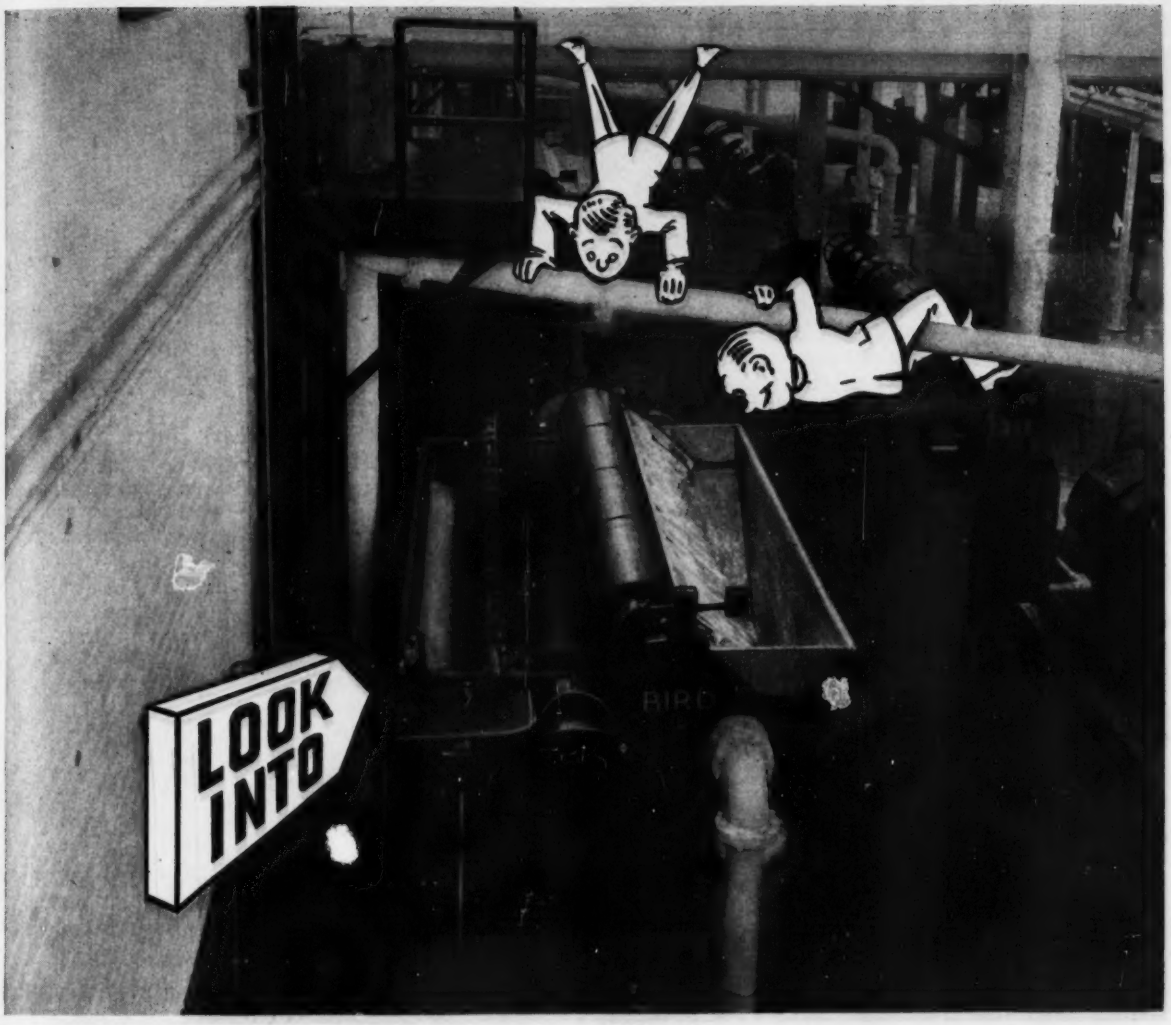
[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 28, 1942—The S. D. Warren Company held their usual Christmas Party Monday evening, December 21, at the offices of the company, 89 Broad street, this city, with all enjoying the occasion to the utmost. There was a Christmas tree and singing of carols. A supper served by a caterer was another feature, which was followed by dancing.

Everybody had a good time at the Christmas Party of Storrs & Bement Company, held Wednesday noon at the offices of the company, 282 Congress street, with a Christmas tree, luncheon and accompanying festivities.

C. W. Williams & Co. to Hold Luncheon

Charles W. Williams & Co., paper merchants at 309 Lafayette street, New York City, will hold a luncheon and pre-New Year's celebration on Thursday, December 31, in the Jade Suite of the Fifth Avenue Hotel, 24 Fifth avenue, New York City. The guests will include 25 employees of the concern and some of its local suppliers. Alfred E. Williams, president of the house, will be host, and he will be assisted by George J. E. Buell, treasurer, who is to be toastmaster for the occasion, and by William E. Madden, secretary, and E. J. Kellerer, assistant treasurer.



Your SAVE-ALL *Situation*

Bird Save-Alls are doing a more useful and valuable job right now than ever. The stock they are recovering and putting back into good paper represents one of the biggest contributions to the conservation program . . . Make sure your Save-Alls are hooked up and operating to maximum advantage. If there is anything we can do to help you make the most of them, don't fail to call on us.

BIRD MACHINE COMPANY
SOUTH WALPOLE · MASSACHUSETTS

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Los Angeles, Cal. — The Angelus Paper Box Company, 747-51 South Broadway, manufacturer of corrugated and other paper boxes and containers, has awarded general contract to Paul A. Stein, 2009 West 39th street, Los Angeles, for alterations in a building at plant, used for general operating service. Work is being placed under way. No estimate of cost announced.

Winona, Minn.—The Winman Fiber Company, manufacturer of fiber products, has approved plans for new addition to plant on Minnesota City road. It will be used for storage and distribution. Erection contract has been awarded to L. J. Ritter, 266 Walnut street, Winona, and work is being placed in progress.

New York, N. Y.—The Palmer Manufacturing Company, a new concern in the city to manufacture paper specialties of various kinds, has leased space in building at 19 West 24th street, and will occupy for converting plant.

Milwaukee, Wis. — The Hummel & Downing Company, 1514 East Thomas avenue, manufacturer of solid fiber boxes and containers, has completed construction of one-story addition, for which general contract recently was awarded to Edward Steigerwald & Sons, Inc., 5310 West State street, as previously noted in these columns, and will place in service at once.

Camden, N. J.—Fire recently damaged a portion of mill of Armstrong Cork Company, foot of Jefferson street, manufacturer of cork board and insulating board products. It originated in the cork board division, on second floor of a two-story structure, which was completely destroyed. No estimate of loss has been announced. It is planned to rebuild. Main offices of company are at Lancaster, Pa.

Milwaukee, Wis. — The Chase Bag Company, 302 East Pittsburgh avenue, manufacturer of paper bags and containers, etc., has awarded contract to H. Schmitt & Son, Inc., 930 East Burleigh street, for exterior improvements in building at location noted, and work will be placed under way at once. No estimate of cost announced.

Los Angeles, Cal.—The United States Gypsum Company, 8430 Quartz avenue, South Gate, manufacturer of wall board products, insulating board, etc., has approved plans for new addition to storage and distributing building at local plant. A permit has been issued and work will be placed under way at once. No estimate of cost announced.

Rochester, N. Y.—The Haloid Company, 6 Haloid street, manufacturer of photographic papers and other processed paper stocks, is running on a capacity schedule in all departments, giving employment to a total working force of more than 500 persons. Company distributed a performance bonus at Christmas, aggregating about $48,000, shared in individual amounts by the entire working quota noted.

Merritton, Ont. — The Alliance Paper Mills, Ltd., has approved plans for new addition to local Lybster mill, used for the production of book, bond, glassine and other processed paper stocks. It will be two-story, about 28 x 60 feet, reported to cost close to $50,000, including equipment. Bids have been asked on general erection contract and award is scheduled to be made soon.

New Companies

Milwaukee, Wis.—The Herrmann Paper Company has been organized to deal in commercial paper goods of various kinds. New company is represented by Allan Polacheck, 710 Plankinton avenue, Milwaukee, attorney.

Stroudsburg, Pa.—The Empire Box Corporation has been chartered under Delaware laws with capital of 500 shares of stock, no par value, to manufacture paper boxes and containers, etc. New company is represented by the United States Corporation Company, Dover, Del.

New York, N. Y.—The Criterion Decalcomania Company, Inc., has been incorporated with capital of $10,000, to manufacture and deal in paper transfers of various kinds. New company is represented by George Knopp, 51 Chambers street, New York, attorney.

Somerville, Mass.—The Somerset Paper Company has filed notice of organization, to deal in paper products of various kinds. Erminio P. Pescatore, 31-A Trull street, Somerville, is head.

Dover, Del.—The Kraft Paper Association, Inc., has been incorporated under Delaware laws, without capital stock, to advance the welfare and interests of the American kraft paper industry. New Organization is represented by the United States Corporation Company, Dover.

W. C. Glynn Appointed Chief

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942 — Announcement of the appointment of William C. Glynn as Chief of the newly formed Transportation Section of the Containers Division of WPB, has been made by the Director of the Division, Charles L. Sheldon.

Mr. Glynn will work out details for conservation of transportation and distribution facilities within the containers industry.

He recently retired as Assistant Freight Traffic Manager of the Pennsylvania Railroad Company. His home is in Philadelphia.

Sigurd Solvason Goes to Southland

Sigurd Solvason, who recently was with the Merritt Chapman & Scott Co., New York, N. Y. (Engineering and Construction Division), is now in the employ of the Southland Paper Mills, Inc., of Lufkin, Tex., as general superintendent of construction, during their mill extension program.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending December 26, 1942

STOCKS

	High	Low	Last
A. P. W.	1½	1⅜	1⅜
Armstrong Cork Co.	32	30½	32
Celotex Corp.	8¼	7⅞	8¼
Celotex Corp., pf.	73¼	73¼	73¼
Certain-Teed Products Corp.	3	2¾	2¾
Certain-Teed Products Corp., pf.	32⅞	31½	31½
Champion Paper & Fibre Co.	18½	18½	18½
Champion Paper & Fibre Co., pf.	100	99⅝	100
Congoleum Nairn Co.	18	17¾	18
Container Corp. of America	16¾	16	16⅜
Continental-Diamond Fibre Co.	6¾	6¼	6¼
Crown-Zellerbach Co.	10⅞	10¼	10½
Crown-Zellerbach Co., pf.	79	79	79
Dixie-Vortex Co.	9¾	9¼	9¼
Dixie-Vortex Co.—A	38¼	38	38¼
Flintkote Co.	16¾	16½	16½
Robert Gair	1⅝	1½	1⅝
Robert Gair, pf.	9⅜	9	9
International Paper Co.	8¾	7⅞	8
International Paper Co., pf.	46½	44½	45⅛
Johns-Manville Corp.	72	70¾	71¾
Johns-Manville Corp., pf.	....	....	....
Kimberly Clark Corp.	26	25½	26
MacAndrews & Forbes	20	19½	19½
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	34¼	33¼	34¼
Mead Corp.	6¼	6	6⅛
Mead Corp., pf.	66	66	66
Paraffine Companies, Inc.	37¾	36⅜	36⅜
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	10⅜	10	10¼
Rayonier, Inc., pf.	26½	26½	26½
Ruberoid Co.	21½	20⅜	21½
Scott Paper Co.	38½	37½	38
Scott Paper Co., pf.	110	110	110
Sutherland Paper Co.	26	25⅜	26
Union Bag & Paper Corp.	7⅞	7⅜	7⅜
United Paperboard Co.	3	2⅞	3
U. S. Gypsum Co.	63¾	60¼	63¼
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	11¾	11¼	11½

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 4½s '47	98½	98	98½
Certain-Teed Products Corp. 5½s '48	95½	94	94
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	105½	105¼	105½
International Paper Co. 5s '47	103	103	103
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending December 26, 1942

STOCKS

	High	Low	Last
America Box Board Co.	4¼	4⅛	4⅛
Brown Co., pf.	....	....	....
Great Northern Paper Co.	26½	26¼	26½
Hummel-Ross Fibre Corp.	3	2¾	2⅞
National Container Corp.	8⅜	8⅛	8⅜
St. Regis Paper Co.	1⅜	1⅜	1⅜
St. Regis Paper Co., pf.	118½	111	111
Taggart Corp.	3⅜	3¼	3¼

BONDS

American Writing Paper Co. 6s '61	90¾	90½	90¾

Marathon Makes Good Report

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 28, 1942—Marathon Paper Mills Company, Rothschild, Wis., had a highly successful year of operations in 1942, according to a report presented by D. Clark Everest, president and general manager, at the annual meeting of stockholders December 21 at the company's offices. While no statement of earnings was published, the president announced that the 1942 earnings were slightly less than those of 1941, with the added federal taxes accounting in part for the smaller net.

The regular dividend of $1.50 per share on preferred stock was declared, payable January 2 to stockholders of record as of December 22. Holders of common stock will also receive a dividend of 50 cents per share, payable February 10 to stockholders of record January 30.

All officers were reelected as follows: C. C. Yawkey, chairman of the board; President Everest; John Stevens, Jr., vice-president of Marathon Operations; Leo E. Croy, Neenah, Wis., vice-president of Menasha Products Division operations; Allen Abrams, vice-president in charge of research; A. M. Van Douser, secretary-treasurer, and R. M. Altman, assistant secretary-treasurer.

Directors elected include Messrs. Everest, Yawkey, Stevens, and Croy; Ben Alexander, Lester Armour and M. P. McCullough, Chicago, Ill.; C. J. Winton, Jr., Minneapolis, Minn., and A. P. Woodson, L. F. V. Drake and C. S. Gilbert.

A. B. Milham Heads Bryant Paper Co.

KALAMAZOO, Mich., December 28, 1942—Elevation of Allen B. Milham to the presidency of the Bryant Paper Company was announced last week. The action was taken at a special meeting of the company's board of directors, following the resignation from that post of Dr. S. Rudolph Light.

Mr. Milham had been serving as executive vice president and manager of the Bryant company since last January, at the time Dr. Light was named president.

Dr. Light, while remaining on the board of directors, quit the presidency because of the pressure of other business, and now will act as vice president. He also is president of the American National Bank of Kalamazoo.

Mr. Milham was manager of Bryant's Imperial division for seven years prior to his advancement last January. A son of W. B. Milham, one of the company's founders, Mr. Milham was a bookkeeper at Bryant before the World War, and joined the purchasing department following the war.

He was purchasing agent from 1920 to 1925, and then was in the sales department for 10 years, until he became manager of the Imperial division.

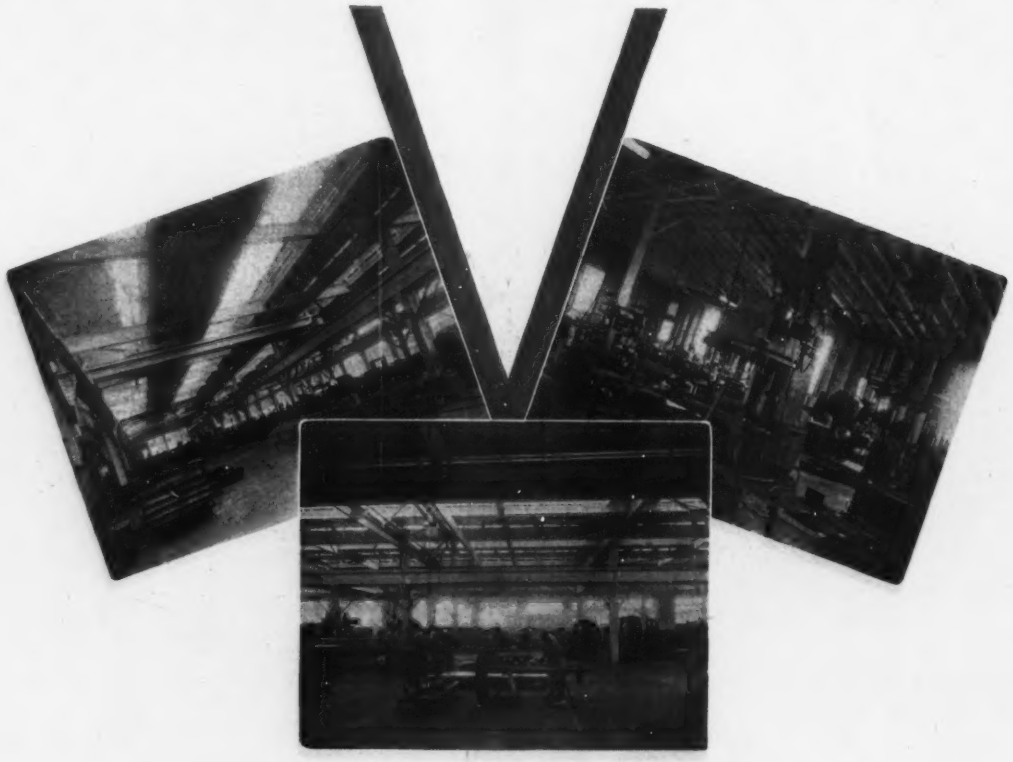
Ralph Hayward, who also is president of the Kalamazoo Vegetable Parchment Company, is continuing as chairman of the board.

Western Tablet Nets $3.01

The Western Tablet and Stationery Corporation for the year to October 31, reports net income after $334,002 Federal income taxes and $570,798 excess profits tax was $574,274, equal, after preferred dividend requirements, to $3.01 a share on 134,854 common shares, against net income of $504,158 or $2.49 a common share for year ended October 31, 1941, after $213,632 Federal income taxes and $17,208 excess profits tax.

Corrugated Paper Votes Dividend

Directors of the Corrugated Paper Company, Fort Wayne, Ind., have declared a 15-cent dividend, payable December 30 to stockholders of record December 21.



★ ★

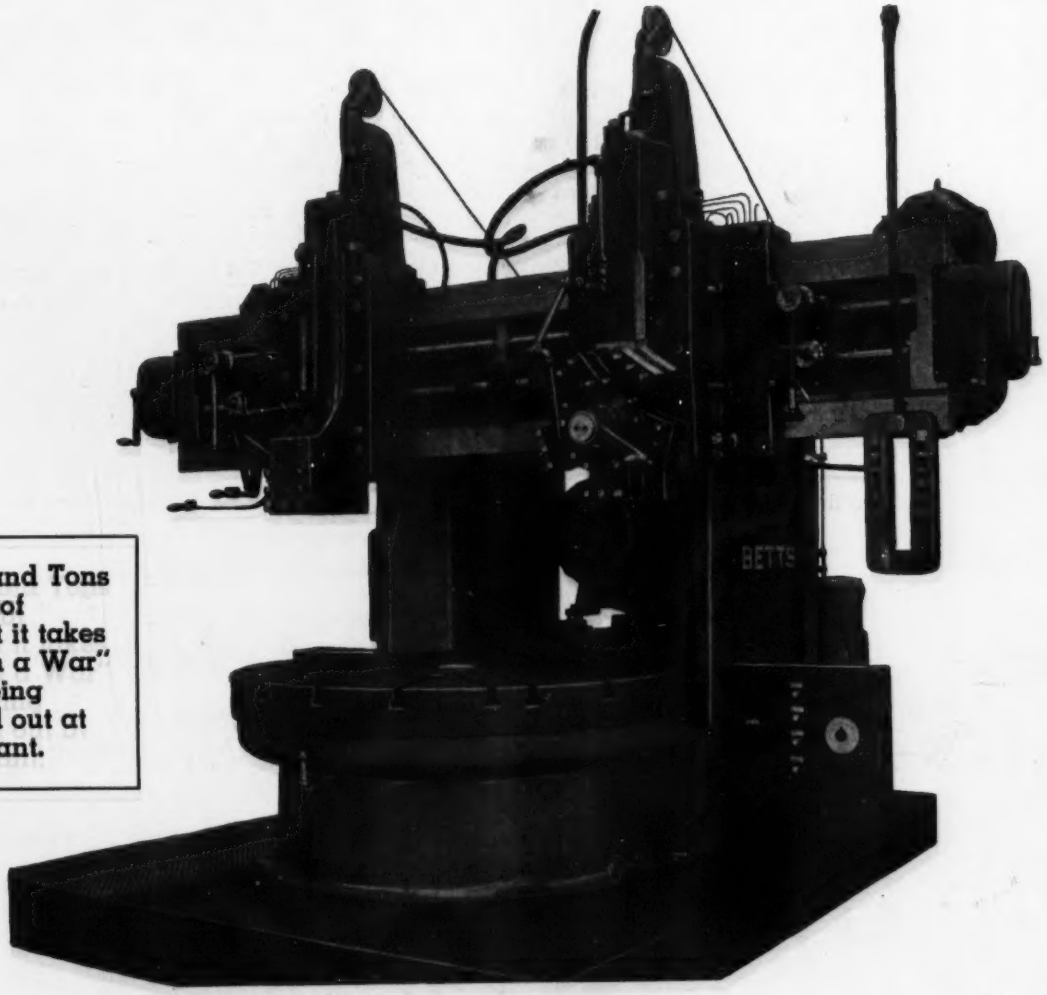
With an enviable record for the production of the finest in Pulp and Paper Machinery, which has served the industry for many years—

IMPCO IS PROUD

to turn over its skill and productive ability to Uncle Sam as its contribution to the fighting efficiency of our armed forces.

However, we are still able to furnish essential parts under proper priority ratings.

★ ★



Tons and Tons
of
"What it takes
to Win a War"
are being
turned out at
our plant.

IMPROVED PAPER MACHINERY CORPORATION

Nashua, N. H.

Victory Tools
by IMPCO

COMPLETE WISCONSIN SURVEY

(Continued from page 7)

peared in papers serving the territory of its mills at Rothschild, Ashland, Menasha and Wausau, Wis., and Ironwood, Mich. Appearing in each advertisement was a complete list of all men who have joined the armed forces, more than 450, with the notation, "We send special greetings to the homes of our employees whose Christmas gathering won't be complete because of the absence of a dad, brother, son or daughter now in America's service." The announcements also contained an admonition to buy more war bonds.

C. G. Parker Addresses Safety Group

Cola G. Parker, president of Kimberly-Clark Corporation, spoke on "Safety" at a banquet of 160 employees of the company's Lakeview mill at Valley Inn, Neenah, Wis., December 22. Those attending were department heads and members of the committees conducting a three months' manpower conservation drive to end December 31. The goal has been to improve the record of the previous nine months by reducing the number of accidents and absences due to sickness, in order to stimulate production for the war effort. An award will be made later to the winning department.

"The effect of industrial accidents in the face of the manpower shortage is a tremendous one," Mr. Parker told his audience. "It is the sacred duty of every worker not to waste an hour for we have a great task to achieve final victory.

"The manpower shortage has brought new problems in safety but no good accident record comes wrapped up in a package . . . it takes vision and hard work. The three E's of safety—education, enforcement and engineering—are not new but new situations call for new ways.

"Your problem of increasing absenteeism is one of education, stimulation, combatting indifference to the safety program and instilling in every worker recognition that others besides themselves are involved."

Mr. Parker developed the premise in his remarks that such trends as social security must not be purchased at the price of liberty and destruction of the free enterprise system. The two are diametrically opposed, he said. "We are part and parcel of the free enterprise system,' 'he added. "Kimberly-Clark's future is your future, not only in the immediate present or future, but in the long run, after the war, in your lives, the lives of your children, and their children."

The toastmaster was Mitchell Johnson and Mr. Parker was introduced by M. E. Palmer.

Ahdawagam Co. Honors Employee

Otto Bein was honored on December 12 for completing fifty years of service with the Ahdawagam Paper Products Company, Wisconsin Rapids, Wis. He asked that no festivities be held and an informal group met him at the company's offices, where he was presented with a watch appropriately engraved, by Frank Walsh, manager. Mr. Bein started work with the company when it manufactured furniture and continued with it when the plant was converted during the last World War to the making of paper products.

ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

Pejepscot Discontinues Newsprint

BRUNSWICK, Me., December 28, 1942—The Pejepscot Paper Company has announced that it will discontinue the manufacture of standard newsprint paper December 31 and has so advised its customers in the newspaper field.

The field for gound wood specialty papers is growing and the Pejepscot Paper Company will use the facilities and labor, which up to this time was engaged in newsprint production, to increase its manufacture of the higher grade paper.

The company's facilities are also engaged about 25 per cent in the manufacture of papers that are ultimately used in the war effort and the company is prepared to extend its participation in the war effort even more.

The company assures the people of the community where the mills are located that the discontinuance of newsprint will in no way affect the general employment and economic situation which has existed here for many years.

Labor Publications Exempted

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942 — WPB has exempted labor publications from the newsprint curtailment orders issued as a result of recommendations of the WPB Printing and Publishing Division, on which labor is not represented.

This decision resulted from a series of conferences held by WPB officials with labor representatives. It is understood, however, that the daily and weekly newspapers affected will undertake a program of voluntary restriction of newsprint consumption.

The following clauses have been inserted in the general conservation order:

" 'Newspaper' shall include any publication usually recognized as a newspaper in the newspaper industry regardless of frequency of issuance. . . . It shall not include any publication pertaining to the 'publications of benevolent, fraternal, trades union, professional, literary, historical, and scientific societies,' . . "

R. I. Cardboard Warehouse Burned

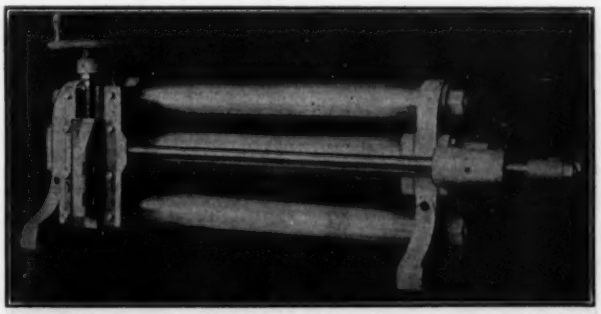
SOUTH ATTLEBORO, Mass., December 26, 1942—A "suspicious" general-alarm fire swept a three-story warehouse containing tons of corrugated cardboard early today with loss estimated at $200,000.

Deputy State Fire Marshal John Sullivan of Taunton and Fire Chief Fred Clark launched an immediate investigation into the blaze that demolished the building owned by the Rhode Island Cardboard Company of Dudley, Mass.

Harry Foss of Pawtucket, R. I., a watchman, discovered the fire and sounded the first alarm.

Firemen from six cities and towns responded to additional alarms and aided Attleboro firemen in combating the flames.

Louis Emerson of Providence, R. I., president of the company, said that the building and its contents were insured for $150,000. The fire raged more than seven hours before being controlled.



Curtis Hydraulic Grinder Lathe

Artificial pulp stones call for maximum rigidity of the stone dressing appliance.

To meet this need in the case of 3-Pocket Grinders our Curtis Hydraulic Lathe was completely redesigned as shown in the illustration above.

The new design has now been in use for about five years.

Full attention is given in its construction to the use of materials to resist the corrosive action of hot pulp.

Adapted to all makes of 3-Pocket Grinders, old or new.

Full particulars will be sent on request.

Montague Machine Company
Turners Falls, Mass.

UNIFORM
SHEET MOISTURE CONTENT

Depends upon CONTROLLED
Pressure Changes

IF you are to get truly uniform sheet moisture content, steam pressure in your dryers must increase or decrease as moisture in the sheet increases or decreases. Maintenance of uniform pressure will not take care of sheet moisture variations, tending only to average out final moisture content.

The outstanding success of the Armstrong Stamm Moisture Control System lies in the fact that it *automatically varies the pressure* to produce UNIFORM moisture content throughout the sheet! This system is delicate in operation, yet ruggedly built and easily operated. Thoroughly proven in service, it is offered on a basis of satisfaction guaranteed. Complete information on request.

ARMSTRONG MACHINE WORKS
818 Hoffman St., Three Rivers, Michigan

ARMSTRONG
ARMSTRONG-STAMM PAPER MILL ENGINEERING DIVISION

ARMSTRONG MOISTURE CONTROL SYSTEMS
DRYER DRAINAGE SYSTEMS
GRADUATE TEMPERATURE CONTROLS
STEAM TRAPS • • HUMIDIFIERS

U. S. Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—The Government Printing Office has announced the following awards for paper: Barton, Duer & Koch Paper Company will furnish 80,000 pounds of white sulphite writing paper at 6.11 cents per pound; Cauthorne Paper Company will furnish 43,484 pounds of white sulphite index paper at 7.25 cents per pound; Middlesex Products Corporation will furnish 20,000 sheets of brown cloth lined paper at $150 per M sheets; and Cauthorne Paper Company will furnish 17,706 pounds of 25% rag yellow bond paper at 14.76 cents per pound.

Frank Parsons Paper Company will furnish 200,000 pounds of machine-finish book paper at 6.35 cents per pound; Bureau of Engraving Ins., Minneapolis, will turnish 4,536 pounds of 25% green bond paper at 11.31 cents per pound; Barton, Duer & Koch Paper Company will furninh 28,188 pounds of white machine finish book paper at $6.70 per cwt.; and the latter will also furnish 234,000 pounds of white sulphite writing paper at 7.25 cents per pound.

Graham Paper Company will furnish 22,512 pounds of 25% rag white bond paper at 11.23 cents per pound; Marquette Paper Corporation will furnish 204,000 pounds of white sulphite writing paper at 7 cents per pound; also 64,000 pounds of white sulphite writing paper at 7 cents per pound.

Marquette Paper Company will furnish 71,750 pounds of green sulphite writing paper at 7.75 cents per pound; 89,600 pounds of white sulphite writing paper at 7 cents per pound; 69,000 pounds of green sulphite writing paper at 7.75 cents per pound; 653,679 pounds of white sulphite writing paper at 7.5 cents per pound; 106,400 pounds of white machine finish book paper at 7.15 cents per pound; 34,200 pounds of white sulphite writing paper at 7 cents per pound; 172,500 pounds of yellow sulphite writing paper at 7.75 cents per pound; and 92,000 pounds of pink sulphite writing paper at 7.75 cents per pound.

Aetna Paper Company will furnish 1,818 pounds of 25% rag yellow bond paper at $12.75 per cwt.; Marquette Paper Corp. will furnish 103,000 pounds of white sulphite writing paper at 6.65 cents per pound; Barton, Duer & Koch Paper Company will furnish 203,750 pounds of yellow sulphite writing paper at 8 cents per pound.

Marquette Paper Corporation will furnish 55,500 pounds of blue sulphite writing paper at 7.44 cents per pound; also 16,300 pounds of salmon sulphite writing paper at 7.75 cents per pound; and 109,335 pounds of blue sulphite writing paper at 7.5 cents per pound.

Paper Corporation of US will furnish 114,044 pounds of 25% rag yellow bond paper at 14.25 cents; Stanford Paper Company will furnish 49,395 pounds of 50% rag lithograph finish map paper at 12 cents per pound; Bermingham & Prosser Company will furnish 224,500 pounds of 50% rag lithograph map paper at 12 cents per pound; Marquette Paper Corporation will furnish 217,500 pounds of white sulphite writing paper at 7 cents per pound; and Frank Parsons Paper Company will furnish 500,000 pounds of white sulphite writing paper at 7 cents per pound.

Collins Manufacturing Company will furnish 46,064 pounds of 25% rag yellow ledger paper at 12.5 cents per pound; Frank Parsons Paper Company will furnish 68,730 pounds of white offset book paper at $7.80 per cwt.; Barton, Duer & Koch Paper Company will furnish 19,106 pounds of manila board at 5.5 cents per pound; and Frank Parsons Company will furnish 557,900 pounds of white machine finish book paper at $6.65 per cwt.; and Barton, Duer & Koch Paper Company will furnish 12,000 pounds of 25% rag ledger paper at $14.35 per cwt.

Jessup & Moore Paper Company will furnish 198,000 pounds of 25% rag white mimeograph paper at 9 cents per pound; Marquette Paper Corporation will furnish 11,781 pounds of salmon sulphite writing paper at 9.75 cents per pound; Frank Parsons Paper Company will furnish 246,000 pounds of yellow sulphite writing paper at $7.45 per cwt.; Barton, Duer & Koch Paper Company will furnish 2,146 pounds of 25% white bond paper at 13.5 cents per pound; Bulkley, Dunton & Co. will furnish 101,000 pounds of salmon sulphite writing paper at $8.35 per cwt.; Marquette Paper Company will furnish 95,400 pounds of white sulphite writing paper at 7 cents per pound; Central Ohio Paper Company will furnish 100,000 pounds of white sulphite writing paper at $6.29 per cwt.; Bermingham & Prosser Company will furnish 100,000 pounds of white sulphite manifold paper at $7.35 per cwt.

Bulkley, Dunton & Co. will furnish 13,179 pounds of white sulphite

ledger paper at 9 cents per pound; Whiting & Company will furnish 69,972 pounds of white ledger paper at 11.98 cents per pound; and also 14,063 pounds of salmon 25% rag ledger paper at 12.48 cents; and 83,966 pounds of 25% rag buff ledger paper at 12.48 cents; and 31,752 pounds of 25% rag white ledger paper at 11.98 cents.

Barton, Duer & Koch Paper Company will furnish 66,600 pounds of 25% rag bond paper for $11,077.80; Bulkley, Dunton & Company will furnish 36,285 pounds of white sulphite writing paper at $7.35 per cwt.; and also 96,000 pounds of 25% rag white ledger paper at 10.58 cents per pound.

Bulkley, Dunton & Company will furnish 20,607 pounds of white sulphite bond paper at $7.80 per cwt.; Barton, Duer & Koch Paper Company will furnish 86,200 pounds of 50% rag white index paper at 10.96 cents per pound; Bulkley, Dunton & Co. will furnish 51,200 pounds of 25% rag white ledger paper at 10.58 cents per pound; Walker-Goulard-Plehn Company, Inc., will furnish 80,500 pounds of 25% rag white ledger paper at 10.41 cents per pound; and Aetna Paper Company will furnish 76,800 pounds of 25% rag white bond paper at 11.21 cents per pound.

Walker, Goulard, Plehn Company will furnish 16,158 pounds of yellow sulphite writing paper at $1,211.85; and 100,450 pounds of yellow sulphite writing paper at 7.28 cents per pound; Paper Corporation of US will furnish 384,000 pounds of white sulphite writing paper at 6.75 cents per pound; Marquette Paper Corp. will furnish 1,386,000 pounds of wood manila paper at 3.85 cents per pound; also 500,000 pounds of newsprint paper at 2.5 cents per pound.

Paper Corporation of US will furnish 40,000 pounds of white machine finish book paper at 7.16 cents per pound; Butler Company will furnish 124,800 pounds of white offset book paper at 7.3 cents per pound; Whitaker Paper Company will furnish 1,816 pounds of 25% rag white bond paper at 12.98 cents per pound; also 58,438 pounds of 25% rag salmon bond paper at 14.46 cents per pound; and United Publishing Co. will furnish 36,000 sheets of Form FPHA 423, for $55.00.

Wilcox, Walter - Furlong Paper Company will furnish 12,903 pounds of white sulphite manifold paper at 87.5 cents per cwt.; Wilcox-Walter-Furlong Paper Company will furnish 166,400 pounds of yellow sulphite writing paper at $6.41 per cwt.;

Just what does it mean?

"A WARREN RECOMMENDATION IS NEVER A COMPROMISE"

★ **It means that conditions and the service for which a pump is to be used are carefully studied.**

★ **It means that we insist upon sufficient information to enable our Engineering Department to make an intelligent and practical recommendation.**

★ **It means that there can be no compromise on quality to meet a competitive price . . . because Warren has only one quality . . . the best!**

★ **It means that every piece of Warren Pumping Equipment is engineered to fit the job . . . *YOUR* job.**

★ **It means ample reserve capacity which is not possible with a "borderline" recommendation.**

★ **It means, in the final analysis, that Warren Pumps not only prevent costly service interruptions but they accomplish this at the lowest possible operating and maintenance costs . . . based upon actual facts and not theoretical promises.**

WARREN PUMPS

Warren Steam Pump Company, Inc., Warren, Massachusetts

Stanford Paper Company will furnish 28,465 pounds of supercalendered book paper at 5.42 cents per pound.

Whiting & Co. will furnish 43,424 pounds of 25% white bond paper at 11.98 cents per pound; also 10,424 pounds of 25% rag bond paper at 11.98 cents per pound; Butler Company will furnish 50,000 pounds of white machine finish book paper at 7.16 cents per pound; and 50,000 pounds of white offset paper at 7.3 cents per pound.

Barton, Duer & Koch Paper Company will furnish 644 pounds of manila cardboard at 7.50 cents per pound; Central Ohio Paper Company will furnish 60,000 pounds of white antique book paper at $6.69 per cwt.; Paper Corporation of US will furnish 83,000 pounds of white antique book paper at 7.15 cents per pound; Bulkley, Dunton & Co. will furnish 175,950 pounds of white sulphite writing paper at $7.35 per cwt.; Marquette Paper Corp. will furnish 25,407 pounds of 25% rag white bond paper at 12.3 cents per pound; also 116,426 pounds of 25% rag white bond paper at 12.3 cents per pound.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger

EDITOR

Vol. 115 December 31, 1942 No. 27

COMING EVENTS IN PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-sixth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 15-19.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Commodore Hotel, New York, February 15-18.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel, New York, February 15-18.

THE NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS' SUPPLIES, Annual Banquet, Commodore Hotel, New York, Tuesday, February 16.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

WAR AND POST-WAR DUTIES

Expressing a deep-seated conviction that industry must practice during 1943 a balance of wholehearted cooperation and constructive criticism, Frederick C. Crawford, president-elect of the National Association of Manufacturers, before the National Conference of Business Paper Editors, at the Waldorf-Astoria Hotel, on December 10, declared that, "Management's responsibility does not end with utmost production for victory. It must show a similar leadership if we are going to preserve individual freedom in the post-war world. . . . No one knows how long the war will last or what the economic situation here and abroad will be when it ends. Consequently my post-war convictions are few and simple. First, I believe we must start planning for that period now, to the fullest extent possible without detracting from the war effort. I do not agree with those who refuse in time of war to prepare for peace, any more than I did with those who refused two years ago to think that we might need a two-ocean navy. America must not wait for an economic Pearl Harbor after the Armistice to start preparing for the problems that must then be faced."

Stating a second conviction that the United States must play a prominent part among nations of the world in guaranteeing that we must not have to live through another holocaust 25 years hence, Mr. Crawford said that he believed that this nation must participate as well in the economic rehabilitation of our sister nations after the war is over. This, he said, is not a policing job to be done by government but an opportunity and a job for private capital and initiative. "Post war reconstruction," Mr. Crawford pointed out, "is going to be an expensive job both here and abroad. Physical destruction must be repaired. War industries must be turned to more productive uses. American industry and the productivity of all other nations once again must be concerned with the primary task of creating better living standards. Government, having no money of its own, can supply the capital needed for this tremendous reconstruction job only by a crushing tax burden which will impoverish our people. Despite the altruism of the American people, I do not believe they will allow themselves to be thus impoverished. Especially so when private capital can do the job to the benefit of those in foreign lands and with profit, through prosperity, to every American citizen."

Continuing, Mr. Crawford said that, "the American people neither want a new form of government and society imposed upon them without their consent, nor do they wish to impose our form of government upon the reluctant citizens of other lands. We are fighting this war for freedom—for the four freedoms of the Atlantic Charter and many which were ignored when that was drawn . . . Political freedom, religious freedom, the civil liberties of a free press and free speech, and freedom of enterprise or initiative without which all other liberties disappear, must be preserved in the post-war world . . . man must have the right to work as he wishes, where he wishes, and at whatever trade he may desire without securing a work permit from either government or any private organization . . . The free man wants to control his own destiny. Unless handicapped by factors beyond his control he will build his own security through his own productivity."

Declaring that he did not want working men and women of this nation to be afraid of peace—to dread the end of the war; to be afraid of unemployment, Mr. Crawford affirmed his belief that there was no need for it if labor, government and industry put the common interests of the nation above special interests. "Industry needs the cooperation of its own management in recognizing that the position we hold is one of public trust. We must be ever mindful that in a republic no power is acquired without a corresponding responsibility. Our power as managers of enterprise is one delegated by the people and is tolerated only so long as it is administered in the best interests of that public. Arrogant management in labor or industry is soon called to account by that public which believes its delegated powers have been misused. Modern management must be governed, not by a narrow devotion to its own interests, but by uncompromising devotion to the public interest."

Declaring that his faith in the public's desire for some real constructive leadership was vindicated by the victory of Albert Hawkes, a former director of

the NAM, in defeating Mr. Smathers, Democratic Senator of New Jersey, Mr. Crawford said in part: "This, as I see it, is the biggest challenge before management today: will we take the same initiative in public affairs we always have taken in the management of our individual businesses? It will mean an end to the easy practice of saying nothing except to criticisze the mistakes of others. It will mean that we will have to take the responsibility of making constructive recommendations of our own, and this includes accepting the blame if these recommendations should go wrong . . . I can see ahead an America continuing strong in defensive armament, supreme in the air, powerful in the tradeways of the globe, just to all peoples, but especially to her own people, and her own institutions, for the survival of which she waged the greatest war of all time."

India Producing Kraft from Bamboo

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 28, 1942—Paul Sykes, Canadian Trade Commissioner in Bombay, reports that considerable progress has been made in India in the manufacture of several types of paper that were formerly imported from abroad. One of the most interesting of recent developments is the production of Kraft paper from bamboo. Several mills are now engaged on this process, which, it is stated, may eventually supplant the usual peace time imports from Europe amounting to some 10,000 tons a year.

Production Ratio Report*

COMPARATIVE WEEKLY SUMMARIES

(Production as per cent of six-day capacity)

Current Weeks—1942		Corresponding Weeks—1941	
November 14	89.8	November 15	107.0
November 21	87.5	November 22	105.3
November 28	83.5	November 29	107.7
December 5	84.9	December 6	106.9
December 12	86.7	December 13	106.3
December 19	*86.8*	December 20	107.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	80.8	82.9	90.7	*87.0*	....	....

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date..	70.0	80.5	81.1	71.7	83.4	86.0	97.6	*91.3*
Year Average.	69.9	80.4	79.8	71.5	83.4	85.6	97.4	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	*82*	..	..

Week ending Nov. 14, 1942—83
Week ending Nov. 21, 1942—83
Week ending Nov. 28, 1942—77
Week ending Dec. 5, 1942—82
Week ending Dec. 12, 1942—84
Week ending Dec. 19, 1942—*85*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

EXPORTERS
OF AMERICAN PULP

TO
BRITAIN
SOUTH AMERICA
AND ALL WORLD MARKETS

LYDDON
& COMPANY
(AMERICA) INC.

51 EAST 42ND STREET
NEW YORK CITY

A long way from paper mills to armament plants but—

One-pass Tunnel Oven in Automobile Plant

Magnesium Heat Treating Oven in Air Plane Engine Plant

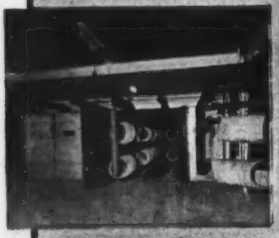
Controlled Humidity Dryer in Drug Plant

Continuous Core Oven in Magnesium Foundry

Our background and experience accumulated over many years of air handling for paper mills, then for high and low temperature drying, baking and heat treating for metal industries made us ready to contribute mightily to the war effort.

Right now we are handling the largest volume of work in our entire history—building ovens, dryers and air handling systems for the production of aircraft engines and parts, ammunition, shells, ships and steel, guns and cannon, jeeps and tanks—and even food. Sorry, we cannot say whose plants these are, but a list would read like "Who's Who" in Airplane and Armament Plants.

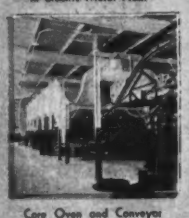
Although our facilities for building and installing are being strained to the utmost, our services are available to Paper Mills who require systems for producing high priority war work. We are also anxious to give every assistance to our customers in maintaining their present equipment to secure from it the longest life and most efficiency. We will gladly give engineering help in developing advanced methods for the period after Victory, consistent with the time required for our vast volume of highly necessary war work.



Wire Baking Oven in Steel Wire Mill

Metal Lithographing Oven in Can Manufacturing Plant

Compartment Oven in Electric Motor Plant



Core Oven and Conveyor in Aluminum Plant

We're "All-Out" For Victory!

All Ross Workers are giving liberally of their skill, time—and money. Not 90% but 100% of all our employees in offices and shops are purchasing War Bonds amounting to not 10% but more than 10% of our entire payroll.

* * * * *

Buy More War Bonds! Collect More Scrap! Conserve Materials!

J. O. ROSS ENGINEERING CORPORATION

Main Office — 350 MADISON AVE., New York, N. Y.

CHICAGO—201 North Wells Street

DETROIT—12953 Greeley Avenue

ROSS ENGINEERING OF CANADA, LIMITED, Dominion Square Building, Montreal

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
Edited by R. G. Macdonald, Secretary

Forming Handsheets for Physical Tests of Pulp

Revision of TAPPI Standard T 205 m-40

This procedure deals with a precision method of forming test sheets from pulps, before or after beating, for testing their physical properties. The testing methods are described in TAPPI Method T 220 m. The forming of test sheets for determining the optical properties of pulp is given in TAPPI Method T 218 m. In TAPPI Method T 221 m is described a companion method for determining the drainage time and drainage factor of pulps which for many purposes may replace the freeness test.

The method has been drafted with two objects in view: first, to duplicate as far as possible (except for the consistency of the stock) the average conditions under which pulp is commercially made into paper, and second, to provide an accurate method with which any existing pulp-testing method may be compared so as to obtain factors to convert the test figures to standard results having an international significance.

The apparatus and method described are practically identical with the standard method adopted by the Paper Makers' Association of Great Britain and Ireland and by the Technical Section of the Canadian Pulp and Paper Association. For further particulars of the original method, together with complete experimental data, reference is made to the "Interim Report of the Pulp Evaluation Committee to the Technical Section of the Paper Makers' Association," and to the second report of the same committee.[1]

Apparatus

(1) Standard disintegrator
(2) Standard sheet machine with stirrer
(3) Standard couch roll
(4) Standard couch plate
(5) Standard pump and press with pressure gage
(6) Press template for centering the sheets and plates in the press
(7) Seven or more mirror-polished disks, 6¼ inches in diameter
(8) Eight or more drying rings with rubber seatings for holding the sheets to the polished disks during drying.

Specifications for the above equipment with illustrations are in Appendix A.

(9) A quantity of sheets of standard blotting paper, 8 inches square, 0.0195-0.0205 inch thick, weighing 245-255 grams per sq. m. and having an absorbency such that when strips are immersed in distilled water at 15° C. the average height to which the water rises in 10 minutes in both machine and cross directions is from 40 to 60 mm.[2]
(10) One 500-ml. enameled cup
(11) One bucket with mark at 16 liters
(12) One 1000-ml. graduated cylinder.

Sampling

When dealing with mill consignments, a sample of pulp the equivalent of about 4 square inches in area shall be drawn from the interior of every bale included in the official test for moisture (disks bored for the moisture test but *not* dried may be used); or in the case of a shipment of chemical pulp where the cook numbers are known, the number of samples shall be proportional to the number of bales representing each cook, provided no fewer than 3 samples from each cook are obtained. When neither of these methods is possible, a sufficient number of samples shall be selected in such a way as to be representative of the whole consignment. The weight of the sample shall be equivalent to at least 100 grams of dry fiber.

Storage of Pulp Samples

Moist pulp samples should be stored under water with a few drops of formaldehyde and kept in a cool place away from direct sunlight. Dry pulp samples should be stored in suitable packages away from heat or light.

Test Specimen

Weigh out to the nearest 0.5 gram a representative sample of the pulp obtained by *tearing* equal portions from all the samples collected, equivalent to 24 grams of moisture-free fiber. Do not cut the pulp or use cut edges. If the sample is dry, wet it in cold

[1] Obtainable from the Secretary of the Technical Association of the Pulp and Paper Industry.

Note: TAPPI Standards may be obtained from the Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York, N. Y., at 25 cents each.

[2] If the absorbency of the blotting paper is much greater than that stated, difficulty may be experienced in couching certain treated or very finely ground pulps. Paper according to specification may be obtained from the Wrenn Paper Company, Middletown, Ohio, and from the Standard Paper Manufacturing Co., Richmond, Va. The commercial basis weight is 100 pounds, 24 × 36—500.

water, tear into pieces about 1 inch square and soak in water for 4 hours; or in the case of a dried sample of mechanical pulp which is to be furnished in the moist form, allow it to soak for 24 hours.

NOTE: As far as is known, soaking pulp for a longer time, for example over night, does not appreciably affect the results.

Procedure

DISINTEGRATION

Make the mixture up to 2000 ml. with cold water (1.2% consistency) and disintegrate for 75,000 revolutions in the standard disintegrator with the propeller running at 3000 r.p.m. in the stock. After disintegration, dilute the stock to 16 liters with cold water (0.15% consistency).

NOTE: For beaten pulps, the amount of pulp taken, the dilution and the disintegration period depend largely upon requirements. In general, however, 8 to 10 grams of beaten pulp diluted to 1500 ml. and disintegrated for 7500 revolutions, satisfactorily dispenses any clots that may be present. If it is necessary to use other conditions, these should be stated in the report.

SHEETMAKING

Partially fill the sheet-machine container with water, taking care that the needle valve is closed. Then let out the water until its level is just above the wire, so as to ensure driving out all the air from beneath the wire. Accurately measure out and pour into the container 800 ml. of the well mixed, dilute stock at 0.15% consistency, the water supply being simultaneously turned on until the depth of the dilute suspension is 35 cm. above the wire surface.

NOTE: The ultimate requirements are sheets each weighing between 1.14 and 1.26 grams moisture-free, corresponding to a basis weight of 60 grams per sq. m. (42.7 pounds, 25 × 40—500), with a tolerance of 5%. Consequently for a finely divided pulp, slightly more than 800 ml. should be added—e.g., 840 ml. for an average groundwood pulp, to allow for a 5% fiber loss through the wire.

Insert the perforated stirrer and in 6 seconds move it steadily down and up six times, keeping the disk beneath the level of the liquid. Repeat this double movement very slowly, once in 10 seconds, and gently withdraw the stirrer. After a pause of 10 seconds, during which time the surface of the liquid should have become almost motionless, fully open the drain cock of the machine with a rapid movement and let all the water drain from the sheet under suction. Immediately after the water has drained from the sheet, tilt the container and couch the sheet off the wire. Unless the machine is of the new pattern with an air-inlet groove at the side of the grid plate, open the needle valve before couching.

COUCHING

Lay two pieces of standard blotting paper centrally on the pulp sheet on the wire. Now lay the flat brass couch plate centrally on the blotters and place the brass couch roll gently on the middle of the plate. Move the roll backward, no other pressure being applied, to within less than ¼ inch of the edge of the plate, which is maintained horizontally by placing the fingers on the opposite edge; then forward to within less than ¼ inch of the front edge; then back and forth four times; and finally to the middle; then lift off the roll. The time taken to perform the five complete rolls shall be about 20 seconds.

Remove the pulp sheet and blotters and covering brass plate from the wire in a manner similar to that of opening the cover of a book, when the sheet will be found adhering to the blotter next to it (the couch blotter). Immediately detach the couch blotter and sheet from the other blotter (couch filler) and plate, and by means of the press template, lay it centrally, test sheet uppermost, on one dry blotter (the press filler) which has been previously placed in the press. Place a mirror-polished plate on the test sheet and cover with another press filler, ready to receive the next couch blotter and sheet.

Wash the wire in the sheet machine in position by turning on the water, and make the next test sheet in precisely the same way. Make a minimum of 7 sheets in all so that the stack in the press when complete will consist of press filler, couch blotter, sheet and plate, repeated 7 times. Finally lay a single blotter on the uppermost plate to avoid possible damage to the press cover.

FIRST PRESSING

Put on the cover of the press and screw the wing nuts down handtight. Raise the pressure, as indicated by the gage, to 50 p.s.i.[3] in ½ minute from the time the needle begins to move, and maintain it there for 5 minutes. At the end of that time release the pressure and remove the press cover.

SECOND PRESSING

After the first pressing, remove the polished plates with test sheets attached from the stack of moist blotters. Using the press template, lay the plate that was on top of the stack during the first pressing centrally on a dry blotter, test sheet uppermost, and cover the sheet with one new blotter. This blotter also serves as a base for the next plate and test sheet. The stack so built on a foundation blotter will comprise plate, sheet, and press filler, repeated 7 times. The order of the sheets is thus reversed in the second pressing. Place the cover in position as before and raise the pressure rapidly to 50 p.s.i. as indicated by the gage and keep it there for 2 minutes. (There is no necessity to fix a time period for attaining the stipulated pressure in the second pressing, because the tendency for the pressure to fall off is very much less than before.)

During couching and pressing, the felt sides of the blotters and not the wire sides shall be in contact with the sheets; and, for the precise work, it is dedirable that those in contact with the sheet be new blotters.

DRYING

Remove the stack from the press and fit the plates with the attached test sheets into a set of drying rings, each test sheet uppermost and in contact with the rubber of the next ring, and place a heavy weight or a clamp on the pile of rings. Do not allow the sheets to dry below the normal moisture content reached by drying under standard conditions specified in method T 402 m. It is advisable to place the pile of rings in the constant humidity room and there dry and condition them concurrently. Allow the sheets to become fully dried in position in the rings before removing them.

NOTE: If there is a shortage of drying rings when making sheets from relatively free stock, it is possible to clamp 2 sheets, with their plates back to back, between each pair of drying rings.

TESTING

Test sheets, especially groundwood sheets, shall

[3] This is equivalent to approximately 60 p.s.i. on the sheet.

be tested within a day after being made and according to the procedures described in T 220 m.

APPENDIX A

Specifications of Apparatus

DISINTEGRATOR

The disintegrator shown in Fig. 1 consists of a removable container, *A*, and brass propellor and phosphor-bronze shaft, *B*, driven at 3000 r.p.m. by a leather belt from an electric motor.

The inside dimensions of the container are 6 inches in diameter by 7.5 inches high, and the inside is provided with four spiral baffles made of ¼-inch square copper rod with rounded ends. The center of the ⅛-inch radiused end of each baffle commences 1.25 inches from the bottom and ends 2.25 inches from the top, having gone exactly halfway round the circumference. The edges of the baffles are rounded with a 1/64-inch radius. Round the bottom of the container is a filet with a ½-inch radius. The outside edge of the container base is beveled and when in position fits into two beveled lugs fixed on the base of the disintegrator. It is secured by a third lug in the form of a sliding clamp, *K*. A pin in the side of the base prevents rotation.

The propeller is 9 cm. (3.55 inches) in diameter and is built up of three 1.6-mm. (1/16-inch) thick, hard brass blades set at 120° apart and sweated into milled slots in a hub. The hub is fitted to the end of the propeller shaft by means of a standard conical seating, nut, and washer. The blades are sloped 2° upwards from the horizontal and thus arranged to throw the stock downwards. The dimension of each blade is 18.2 mm. (0.72 inches) wide at its junction with the hub, and 22.5 mm. (0.89 inches) wide just before the edges of the tip are radiused 4.0 mm. (0.16 inch). The edges around the blade are rounded to a 1/32-inch radius.

The shaft *B* is arranged to slide up out of the way of the container by loosening the collet chuck, *C*, which grips the shaft to the driven pulley. The driven pulley is mounted on a hollow shaft which runs in ball bearings in the housings, *D*, and at the upper end of the shaft is a worm wheel, *E*, fixed to the shaft by means of a grub screw, and geared to the revolution counter, *F*, by a 25:1 worm wheel. The thickness of the spacer washer, *G*, is such that when the propeller is pushed right down, the bottom edges of the blades are 1 inch from the bottom of the container. The upper portion of the clamp *K* is made 1 inch wide and may conveniently be used for checking this height.

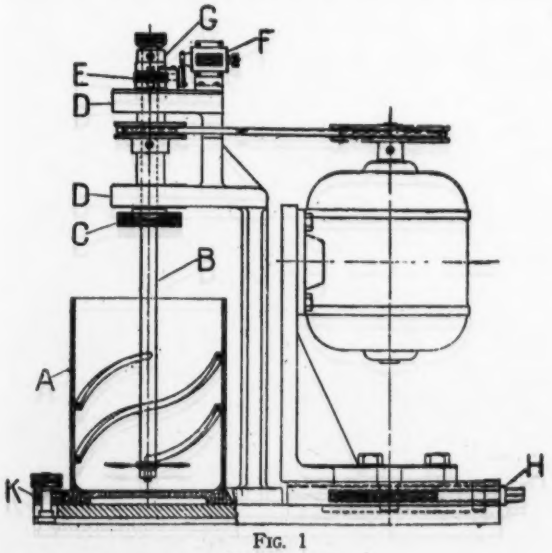


FIG. 1
Disintegrator

An alternative construction for holding the shaft has been found desirable in some instances. The spacer washer *G* is replaced with one made of steel about 1¼ inch outside diameter and ½ inch thick, having a pair of dogs integral with the body of the washer, ⅛ inch or more deep, which fit into corresponding slots cut in the upper end of the shaft sleeve. This washer contains a 3/16-inch or ¼-inch Allen or similar headless set screw, which engages in one of two depressions cut in the propeller shaft so as to locate the propeller either 1.0 or 2.0 inches above the bottom of the container.

The tension of the round leather driving belt is adjusted by means of the screw at *H*, which moves the motor support.

The ¼-h.p. motor may be arranged for either a.c. or d.c., the former being preferable as the drop in speed when the propeller is immersed in the stock is only about 1%, whereas with a d.c. motor the drop may be as much as 8%. The speed of the propeller may be altered appreciably by means of the belt tension. Take care to check the speed if the belt is replaced by a new one, because a variation in the diameter of the belt also affects the propeller speed.

Keep the worm wheel and eccentric for the counter arm greased, otherwise the counter arm is liable to wear, and after a time the counter ceases to function correctly. If wear takes place, the trouble can be remedied by loosening the clamping screw on the boss of the arm and resetting it.

Take care not to bend the propeller blades when removing the propeller from the shaft. It is best detached by fitting the jaws of an adjustable spanner over the hub and tapping the top of the spanner.

A propeller gage, furnished with the disintegrator, is used to check the blades if they are suspected of being bent.

NOTE: The vital parts of the above specifications are: (*a*) details of the container; (*b*) propeller design and position; and (*c*) propeller speed.

If gummed up with pitch, the propeller shaft and sleeve may be cleaned by holding the propeller with one hand, starting the motor, and applying a few drops of light lubricating oil to the shaft while moving it up and down while the sleeve is rotated by the motor.

SHEET MACHINE

The complete sheet machine is shown in Fig. 2. The main parts of the machine consist of a base, *B*, connected by a drainage pipe, *P*, and cock, *G*, to the sump; a wire-covered grid plate, *C*, on which the sheet is formed, and which rests in the top of the base; and a cylindrical container, *A*, which is preferably provided with a hinge and which fits over the plate and the base.

The outer trough for overflow water is connected to the sump by means of two brass drain pipes, *J*. Around the top of the funnel of the base is machined a recess on which the grid plate rests. In the new hinged model an air vent is cut in this recess which

is closed by the rubber gasket in the base of the cylinder when in position. The inside of the funnel is carefully machined and a removable 4-fin baffle, *L*, made of 1/16-inch brass sheet, rests in it. The function of the baffle is to prevent any possible swirling, the horizontal disk being placed over the drainage pipe to distribute the suction uniformly over the grid plate.

The grid plate, which is 6 13/16 inches in diameter and 23/64 inch thick, is perforated all over (except for a ¼ inch wide ring round the edge) with ⅜-inch square holes, spaced about ½ inch (0.486 inch), the ribs so formed, which are about ⅛ inch thick at the base, being tapered and then beveled to an edge 1/32 inch thick at the top, and the top corners formed by the intersection of the edges of the ribs are removed by a V cut so that, in effect, the wire laid upon it is supported by the equivalent of a ½-inch mesh wire.

The screen on which the sheet is formed is 150-mesh (diameter of wires 0.0026-0.0028 inch) and is backed by a 20-mesh screen (wire diameter 0.0148-0.0150 inch), both being stretched flat and fixed round the edge by soldering, or in the new model by means of an annular clamping ring, to the surface of the plate.

The top part of the apparatus, the container *A*, is 3/16 inch thick, 15.75 inch high and exactly 6.25 inch (15.88 cm.) inside diameter. A groove is cut 350 mm. (13.75 inch) from the surface of the wire. The bottom of the cylinder is stepped out to fit over the base of the instrument and carries a soft rubber ring, which makes contact round the edge of the grid plate. The cylinder is made either to lift on and off, or in the new model is provided with a hinge and clamp, so that a watertight joint is made between the cylinder, the upper edge of the top face of the plate and the upper edge of the base.

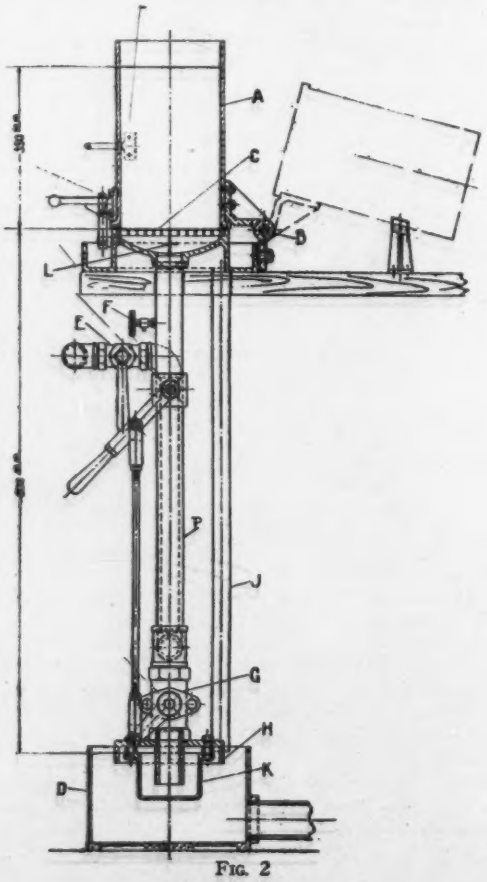


FIG. 2
Sheet Machine

A needle valve, *F*, which is desirable but not essential if the air vent is cut, is placed in the drainage tube 6 inches down from the surface of the wire. The drainage valve, *G*, is operated by a lever mechanism as shown in the figure.

The sump consists of a cylinder, *D*, with an outlet hole threaded for a 2-inch pipe either in the side as shown or in the center of the bottom if required. Three lugs are provided for screwing the sump to the floor.

A cross bar, *H*, carries a circular apron to prevent splashing, and bolted to the underside of the bar with distance pieces is an overflow vessel, *K*. The distance from the surface of this vessel to the top of the wire is adjusted to be exactly 800 mm. (31.5 inches). This is the suction head on the wire.

The drainage pipe, the bore of which is actually 1⅜ inches, is connected by means of a 1¼ to 1½-inch T-piece and ½-inch elbows to the water supply valve, *E*.

The perforated stirrer (not shown) has a disk 6⅛ inches in diameter, perforated with sixty 7/16-inch diameter holes. To the central rod of the stirrer are fixed four baffles 1/32 inch thick, 2¾ inches wide and 6 inches deep, with their lower edges 1 inch from the disk. These prevent swirling. All edges are carefully rounded and smoothed so as not to collect fibers when the stirrer is used.

The couch plate is of hard sheet brass, 6.75 inches in diameter by 0.020 inch thick. The couch roll (not shown) is made of brass, 4 inches in diameter with a 7-inch face, and weighs 13 kg. (28.67 pounds).

NOTE: Owing to the accuracy required in the construction and dimensions of the sheet machine and grid plates, it is advisable to use a machine approved by and bearing the official serial number of the Paper Makers' Association of Great Britain and Ireland. Approved machines are now being manufactured in several countries; for use in U.S.A., by the Herman Manufacturing Company, Lancaster, Ohio; for use in Canada, through the Forest Products Laboratories, 3420 University Street, Montreal, P. Q., Canada; for use elsewhere, through the Paper Makers' Association, Melbourne House, Aldwich, London, England.

PRESS

A side elevation of the press is shown in Fig. 3. The cover, *A*, is of cast aluminum and the base, *B*, is of close-grained cast iron. A hard brass disc, *C*, 6⅞ inches in diameter, is properly bedded and fixed in the lid. The cover is provided with a handle and is held down by means of four 1-inch diameter phosphor-bronze studs and chromium-plated hard-brass wing nuts. The base is recessed to contain a heavy rubber diaphragm, *D*, held down round the edges by a brass annular ring with a large number of brass countersunk screws. A flat platen, *E*, 6⅞ inches in diameter, is loosely fitted inside the ring to rest on the diaphragm, and the platen is prevented from coming out by 4 lugs, *F*, which work in 4 shaped slots round its edge. The upper and lower surfaces of the brass plates are carefully machined flat. The working fluid (glycerine) is forced under the rubber diaphragm and the maximum distance through which the platen can rise is ⅜ inch. The machined surfaces

of the cast-iron base are well covered with aluminum paint to prevent rust.

NOTE: From the construction of the press it will be noticed that the platen is free to float on the rubber diaphragm. This ensures that an even pressure is applied over the entire surface of the pile of sheets and blotters, and in this respect is superior to plunger-type presses. The press should never be used for small pieces of paper, etc., as by virtue of the feature just mentioned, if a high pressure is employed, the platen is liable to bend round the object pressed.

PUMP

The pump is shown in Fig. 4. The body is made of gunmetal and has a bore of 1.75 inch and a 4-inch stroke. The pressure is applied by means of a gunmetal plunger, *D*, which is actuated by a steel left-hand screw, *C*, through a bronze thrust washer, *B*, and nickeled or chromium-plated brass handwheel, *A*. A cup leather, *F*, held in position by a brass washer and nut, *G*, prevents leakage. This leather washer assembly is screwed into the plunger at *H* and the plunger is prevented from rotating by means of a hardened steel screw, *J*, working in a slit, *E*, cut in it. Both press and pump are mounted on a heavy wooden base.

The pump is usually shipped filled with glycerine. If ever necessary to refill the pump and press with fluid, remove the gage and screw in its place the special filler cup supplied. Turn the handwheel clockwise till the plunger is farthest in, and then fill the cup with pure glycerine while the handwheel is slowly turned to draw the liquid into the body of the pump. When the pump itself is full, unscrew the filler cup and replace the gage. Loosen the screws round the annular ring, holding down the press diaphragm several turns with a screwdriver, and remove the 4 screws and lugs holding down the platen. Turn the handwheel to force the glycerine into the press, whereupon the air escapes round the edges of the diaphragm, the platen being prevented from rising by hand pressure. As soon as glycerine begins to exude, wipe off the diaphragm and platen with a moist rag, replace the platen and lugs, and by tightening each screw in the annular ring in turn a small amount at a time, clamp the diaphragm in position. If the screws are not tightened uniformly, the diaphragm will not be flat. It is undesirable to tighten the screws any more than is necessary to prevent leakage. Put on the cover and screw the wing nuts handtight. Again remove the gage, screw in the filler cup and fill with glycerine. Turn the handwheel forward (this eliminates a few air bubbles) and then backwards, until it comes to the stop, meanwhile keeping the filler cup supplied with glycerine.

Withdraw the filler cup and replace the pressure gage. Remove the press cover and turn the handwheel

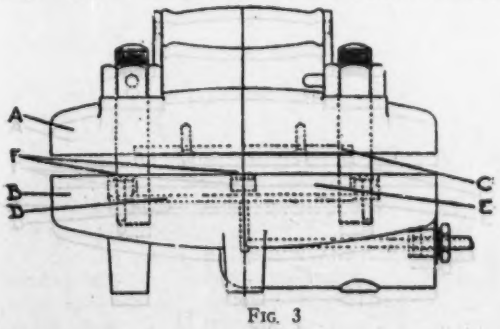


FIG. 3
Press

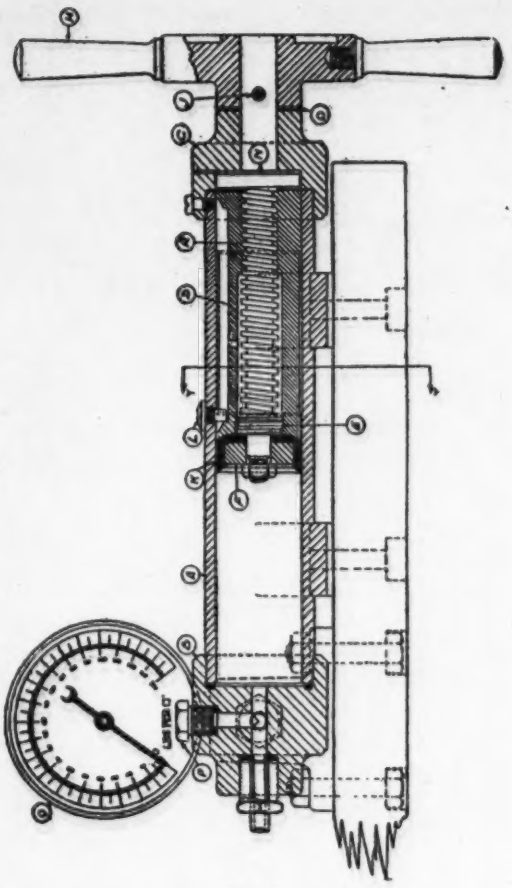


FIG. 4
Pump

forward to its farthest extent. If the platen is felt to touch the lugs before the handwheel is fully screwed in, remove the gage temporarily and turn the handwheel fully home so as to express the superfluous glycerine.

NOTE: The above press and pump specifications are not vital, provided that the apparatus used is capable of providing a uniformly distributed pressure of the same magnitude. This is equivalent to an actual pressure of about 60 p.s.i. on the test sheets. A template for centering the stack of sheets in the press is necessary.

PRESS TEMPLATE

The press template for centering the sheets (not shown) is of aluminum. The guide slots fit over any two adjacent studs in the press, and when in position, the semicircles 6.25 inches in diameter, which is cut in it, is concentric with the platen of the press.

DRYING PLATES

The mirror-polished stainless steel or chromium-plated brass plates (not shown) are 6.25 inches in diameter and about 0.020 inch thick. They should be free from bulges or uneven edges and if any are damaged in this way and not capable of being repaired, they should be discarded. When not in use, they should be kept in a saw-slotted wooden block, suitably made to hold them.

DRYING RINGS

The drying rings (not shown) are made of hard

brass and arranged to fit into each other, clamping each polished plate and test sheet round the edges. The circumference of the sheet is gripped by the rubber seating and the plate pressed against this by the extended portion of the ring below. For many purposes, however, the rubber seating is unnecessary and two plates, back to back, may be placed in a single pair of drying rings, thus doubling their capacity. The air for drying circulates through eighteen ¾-inch diameter holes.

APPENDIX B

Testing of Board Stock

Pulp suitable for paperboard manufacture is as a rule relatively weak and relatively free, and often contains quantities of shives; consequently, it is suggested to use 150 grams per sq. m. as a standard basis weight for testing this class of stock, employing 1000 ml. of stock at 0.3% consistency for each sheet and determining the drainage corrected to 150 grams per sq. m. and 20° C. Four pieces of blotter are employed for couching in place of the two required, and two dry blotters in place of the single blotter normally required in both first and second pressings, the rest of the procedure for disintegrating and testing remaining the same as for papermaking stock.

APPENDIX C

Modification for Routine Control Work

A speedy and simple method suited for groundwood mill control has been described by Clark (*1*) in which the drainage time and the strength of the pulp may be obtained in about 15 minutes by use of this apparatus.

It is clear that between this rapid method and the complete standard method, a suitable routine method can be devised to meet any required conditions. Where substantially unbeaten stocks are being tested, the double pressing may be dispensed with and the sheets given a single pressing for 5 minutes at 50 p.s.i. gage pressure, without using the plates, then separated from the blotters and dried in a current of air in the humidity room for testing. Some of the results will be nearly the same as with the standard method, because the gain in strength due to shrinkage in this case is nearly equal to the loss of strength occasioned by the omission of the second pressing. An allowance will have to be made for the decreased diameter of sheets made in this manner for the basis weight determination.

If departures are made from the standard method as described or different apparatus is used, it is recommended that conversion factors be obtained for the type of pulp being tested and with their aid the results approximated to standard.

APPENDIX D

Rapid Methods of Drying and Conditioning

An excellent method of drying and conditioning the sheets has been developed by the Forest Products Laboratories of Canada which shortens the time required for both to less than an hour, while still conforming to the standard procedure. The apparatus consists of a closed box provided with one or more 6-inch wide vertical slots in its sides, inside and against which the drying rings are stacked. An electric fan exhausts air from the box through a suitable opening, the air passing in through the holes in the drying rings and over the sheets. The whole apparatus is kept in the constant-humidity room.

NOTE: If a fan is used to *blow* air into the box, the fan motor may become heated and, being in the path of the air, may cause the relative humidity of the air passing over the sheets to be appreciably lower than that of the air in the room.

Alternatively, in a constant-humidity room it is sometimes more convenient to lead part of the conditioned air to a slotted duct on one of the walls, the duct having slides and clamps to hold the rings. The conditioned air is thus blown through the rings and over the sheets and dries and conditions them effectively. This obviates the need for an additional fan and makes a particularly neat piece of equipment.

Another modification for obtaining results quickly, including a good design for a rapid air drier, has been described by Bradshaw (*2*).

APPENDIX E

Sheet Shrinkage

The shrinkage during drying may be determined as follows: After pressing make two marks on the sheet 15.0 cm. apart, preferably with a gage made from two chisel-pointed pins set in a suitable metal holder, after inking the points with a moistened indelible pencil. Pull the sheet off the plate in a direction perpendicular to the marks, then allow to dry without restraint and measure the shrinkage between the marks. This shrinkage, expressed as a percentage, is a useful indication of the degree of hydration of the pulp.

Additional Information

At the annual meeting of the Canadian Pulp and Paper Association in 1931 was presented the result of an investigation (*3*) into the method by the Forest Products Laboratories of Canada, employing free and slow groundwood, sulphite, kraft, and soda pulps. A close relationship between the resulting strength of the pulps and those obtained by the Canadian method then existing, a slightly modified Genberg-Laymon method, was indicated, with reproducibility in favor of the British apparatus and method. A further report (*4*) of comparative tests on several sheet-making machines and methods, presented at the annual meeting in 1932, definitely confirmed the superiority of the method described. A concurrent independent investigation by Laymon (*5*) between the Genberg-Laymon method (previous TAPPI method) and this method gave similar indications. Some experimental conversion ratios for the two methods are also given in that paper. An independent investigation (*6*) by the U. S. Forest Products Laboratory in Madison in 1933 has also confirmed the superiority of this method. Reference is also made to a discussion of the differences between the two methods at the 1930 TAPPI fall meeting in Erie, Pa., when the apparatus was first demonstrated in this country.

An informative paper by Harrison (*7*) contains much experimental data on the operation of this apparatus and method with pulps beaten in a Lampen mill.

A companion precision method for evaluating the beating characteristics of pulps, using a laboratory kollergang, is described in detail by Clark (*8, 9*).

Literature Cited

1. Clark, J. d'A. "Pulp and Paper Manufacture in North America," *Proc. Tech. Sect., Paper Makers' Assoc., Gt. Britain, Ireland,* VII, Part 2, pp. 242-246 (March, 1927).
2. Bradshaw, F. W. "Routine Control Testing," *Pulp Paper Mag. Canada* 33, no. 10:481-484-518 (Dec., 1932).
3. Adlington, W. E., Jones, C. G. G., Alexander, G., and Legendre, J. R. A. "Comparison of the Canadian and British Methods of Preparing Test Sheets." *Pulp Paper Mag. Canada* 31, no. 26:766-767, 780, 782 (June 25, 1931); *C.P.P.A. Proc. Tech. Sect.* 1932, pp. 9-15.
4. Report of the Canadian Committee of Chemical and Physical Standards, *C.P.P.A. Tech. Sect. Proc.* 1931, pp. 7-11.
5. Laymon, H. W. "American and British Pulp Testing Methods," *Paper Trade J.*, 92, no. 26:43-46 (June 25, 1931); *Tech. Assoc. Papers* 14:254-257; discussion, 104-106 (May, 1931).
6. Doughty, R. H., and Curran, C. E. "A Comparison of Sheet Machines for Pulp Evaluation," *Paper Trade J.* 97, no. 23:38-44 (Dec. 21, 1933); *Tech. Assoc. Papers* 17:463-469 (1934).
7. Harrison, H. A., "The Beating of Wood Pulp in the Laboratory and Mill," *World's Paper Trade Rev.* (Dec. 5, 1930); *Proc. Tech. Sect. Paper Makers' Assoc. Gt. Britain Ireland* 11, part 2:272-333 (March, 1931).
8. Clark, J. d'A. "Kollergang Beating Method for Pulp Evaluation," *Paper Trade J.*, 100, no. 11:36-44, March 14, 1935; *Tech. Assoc. Papers* 18:158-166 (1935).
9. Clark, J. d'A., and von Hazmburg, R. S. "Further Notes on the Kollergang Beating Method for Pulp Evaluation," *Paper Trade J.* 102, no. 14:35-38 (April 2, 1936); *Tech. Assoc. Papers* 19:163-166; discussion, 99-100 (June, 1936).

Forestry College Appointments

Professor Raymond F. Crossman, vocational guidance counsellor of the Yonkers High School of Commerce, and teacher, has been appointed registrar and assistant professor at the New York State College of Forestry, Syracuse University, according to an announcement by the Dean of the College, Samuel N. Spring.

Professor Crossman succeeds to the office formerly held by the late Professor I. Laurance Lee. He is a graduate of Syracuse University, A.B. '26, M.A. '31. He was an instructor in business administration from 1926 to 1931; studied and taught English under Professor Lee's supervision and took training in Teachers' College Graduate School, Columbia University. His work at the Yonkers High School involved teaching, administrative duties, entering new pupils, planning and scheduling the program and assisting teachers.

"His experience in vocational and educational guidance, techniques in guidance, and aptitude testing is opportune," says Dean Spring, "as these problems will arise in connection with the new third term planned by the college, and the registration of high school students in January and June, especially in handling applications by three- and three-and-a-half-year high school students."

Dean Spring also announces the appointment of Professor Lucian P. Plumley of the New York State Ranger School, as successor to Professor Harry S. Mosebrook, who was drafted in the Coast Guard.

Professor Plumley is a graduate of Technical High School of Buffalo, the Ranger School 1931, and the New York State College of Forestry, 1935. He majored in general forestry which qualifies him for forest extension service in advising and demonstrating practical forestry to woodland owners.

Allen Abrams in Washington

Allen Abrams, vice president of the Marathon Paper Mills, Inc., Rothschild, Wis., is now deputy director of the Research and Development Division of the Office of Strategic Services, Temporary Building One, Washington, D. C.

This service is headed by Col. "Bill" Donovan.

Dr. Abrams was formerly president of the Technical Association of the Pulp and Paper Industry.

Raw Materials for War Effort

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 23, 1942—The Senate Committee on Small Business has been calling on WPB, the War, Navy, Interior and Commerce Departments to find out what is being done and what they proposed to do toward getting a more adequate supply of strategic and critical raw materials for the use of the Nation in the war effort.

Each agency has been asked to outline the production prospects of smaller domestic producers of each strategic or critical raw material, together with all possible methods of increasing the supply of the three metals under the Controlled Materials Plan—steel, copper, and aluminum, and of zinc and magnesium.

Senator Murray, chairman of the Senate Committee on Small Business, has received a continuous flow of complaints from the smaller mine operators of the country, who say that their productive capacities are being sparsely used, although it seems to be general knowledge that the production of metals and minerals is not up to expectations, either for present or prospective requirements.

"The Senate Committee on Small Business," the Senator said, "has a double interest in the raw materials supply. First, we want to sift these complaints to the bottom. Second, in our effort to get smaller plants into war production, we want to know why the total supply of raw materials cannot be increased for that purpose. Metals and minerals are the life-blood of our war-effort, on the home front as well as on the battlefront."

The determination of the Committee to seek this information follows the recent testimony of James W. English, president of the Boulder Mining Company, who described to the Committee on October 8 how he and his associates, owners of a lead and zinc mine in Arizona had been given a year's "run-around" by Washington war agencies. After the agencies had examined the mine, pronounced it worthy of development and expansion in the war effort, and advanced $40,000 of a promised $200,000 for that purpose, they decided that the mine should be abandoned. This decision was made almost at the moment when the mine was ready to double its production. This case may be taken up in more detail when Secretary of the Interior Ickes appears before the Committee in the near future to give his views.

The Committee has sent a detailed list of questions to each of the five Government agencies previously named, covering five headings: the measuring of requirements for raw materials; the obtaining of supplies of raw materials; problems involved in certain specific materials; previous experience of personnel handling raw materials; and relationships among the various Federal agencies.

Each agency is asked to outline the step-by-step procedure whereby it may calculate material requirements, including stockpile requirements. With regard to supply, each agency has been asked, "What are the major obstacles in the path of increased domestic production of strategic and critical raw materials? Of increased domestic production through use of sub-marginal mineral resources?

Another aim is to discover what improvements may be necessary in the present division of responsibilities among the various Federal agencies dealing with raw materials supply.

Ten Years of Fundamental Research in the Pulp, Paper, and Paperboard Industry

By Harry F. Lewis[1]

In June, ten years ago, C. E. Curran, Chairman of the Division of Research and Development of the TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, asked the author to take the chairmanship of a committee whose organization had been approved by the Executive Committee of TAPPI. This committee was to be called the Fundamental Research Committee. Its objectives were:

Objectives

1. To foster work and present papers in the fields of fundamental cellulose and pulp and paper subjects.
2. To sponsor symposia where representatives of pulp and paper companies and related laboratories would report on such phases of their fundamental research as could be disclosed.
3. To outline fundamental research problems which could be used by university and other nonindustrial research agencies.

When the subject of this paper was originally submitted to the Secretary's office, it was the intent of the author to review the steps in the organization of the Committee, the procedures followed in securing from the TAPPI membership those problems which seemed to them to have fundamental significance, the organization of this material to a related program of fundamental research, and finally a report of progress intended to convey to the listener or reader the idea that the project set up in the original program had been diligently investigated, and as a result the Committee could take unto itself a feeling of pride in a job well done, fold its respective hands, and take sabbatical leave.

Instead, as each field of work was reviewed, it became evident that fundamental research in the field of pulp, paper, and paperboard is closely related to the well-known experience of Hercules and the hydra. Every time he cut off one head, ten came to take its place. As one problem was solved, a host of new ones arose. To complicate matters, the program of papers to follow this introduction lengthened. The time available for the review became less and less, and because of your interest in the contents of the papers to follow, this particular paper has been materially shortened.

Any attempt to review the various fields of fundamental interest with fairness to all the workers in those fields in a few minutes is obviously impossible. During the past ten years, literally hundreds of reports have appeared in the technical literature, covering phases of the outline of fundamental research originally set up by the Fundamental Research Committee. Naturally some of these fields have been more active than others, not because they were of necessity more important but because of a happy combination of circumstances and investigators. No attempt will be made, therefore, to review all of the work done in the field. Such reviews covering this ten-year period will be found in Volumes 6, 8, and 10 of the *Annual Survey of American Chemistry* under the chapter on "Cellulose Chemistry" and in "A Survey of the American Literature in the Field of Cellulose and Related Subjects 1933 through 1937," prepared under the auspices of the Committee on Cellulose and Allied Substances of the Division of Chemistry and Chemical Technology of the National Research Council, appearing in the *Paper Trade Journal* vol. 107, nos. 21, 23, and 24 (1938), and in a more recent report by the same Committee covering the years 1938, 1939, and 1940. This review is in the hands of the Secretary of TAPPI and it is hoped it will be published during the coming months.

Instead of discussing all of the fundamental research in the field, the author will content himself with brief reviews of the fundamental research in the fields of fiber structure and the physical and chemical components of fibrous raw materials with emphasis on those fields in which the greatest activity has prevailed, and even here the reader is referred to the detailed reviews cited for specific references and to the original literature for a more exact statement of the work.

Fiber Structure

The first subject listed on the proposed program of fundamental research set up by the Fundamental Research Committee dealt with the structure of fibrous raw material. It also happens that a large number of researches have been carried out dealing with the structure of papermaking fibers, both as they exist in nature and in the form in which they are used in papermaking. Certain portions of this research activity have even taken on the aspect of almost religious ardor, since some of the evidence as presented appears to shake the very foundations of our concepts of fiber structure.

Possibly the greatest amount of discussion during this past decade has centered around Farr's observations that in cotton fibers the fibrils are made up of cellulose particles (each 1.5 to 1.1μ) arranged end to end in orderly single rows. Each particle in the fibril is assumed to be coated with a viscous material which functions as a cementing material holding the particles together to form the fibril; the fibrils are arranged layer upon layer to form the membrane lamellae. These particles are doubly refractive in polarized light, the refractive indices of the moist particles in the living cytoplasm of the cotton fiber being 1.565 lengthwise and 1.530 crosswise. The particles swell and turn blue in the presence of sulphuric acid and iodine. Their combustion analyses check very closely with the carbon and hydrogen content of cellulose.

It is very difficult to see how any concept of a fibril having as its minimum thickness 1.1μ can be fitted into a picture such as is presented by Kerr [*Protoplasma* 27, no. 2:229-41 (1937)], who has noted that the width of the daily deposition of cellulose in the growing cotton fiber in many cases averages approximately 0.25 to 0.27μ in thickness. Kerr

[1] Member TAPPI; Chairman, TAPPI Fundamental Research Committee; Dean, The Institute of Paper Chemistry, Appleton, Wis.

turther has noted that, in the period of secondary wall deposition in the cotton fiber two lamellae, one compact and one more porous, are deposited every 24 hours. Anderson and Moore [*Am. J. Botany* 24, 8:503-507 (1937)] have grown cotton under the influence of constant light and temperature and have succeeded in producing fibers which show no growth rings in their walls. This finds a remarkable analogy in certain of the woods grown in the very southern part of the United States which show neither spring- or summerwood nor annual growth rings.

This observation of Farr's raises a very definite question as to the existence of submicroscopic micelles of varying dimensions in the membrane.

While the questions raised by Farr in connection with the cellulose particles have not been answered to the complete satisfaction of everyone, the audience is reminded of the electron microscope picture shown in the general meeting of TAPPI on Monday (Feb. 16, 1942) in which cellulose strands having a diameter of certainly not more than 50 A. units were shown. Either these have arisen from a definite breakdown of the cellulose particle under the influence of beating, or the particles themselves represent merely an intermediate stage in the breakdown of visible fibers to structures made up of a relatively limited number of cellulose molecules.

Farr has likewise shaken our complacency with regard to our knowledge of the nature of cellulose in cuprammonium solutions by suggesting that the cellulose component of the plant cell membranes does not dissolve in cuprammonium to produce the viscosities commonly attributed to it, but that the cementing material referred to above is responsible for this much discussed phenomenon. Without going into the pros and cons of this subject, if Farr is correct, then the measurement of viscosities of pulps, carried out in cuprammonium solution for the control of the various papermaking operations, has been based upon a false premise, and the cementing material and not the cellulose becomes the important component of the fiber. However, it has been rather well demonstrated by Howells, Heuser, and Green, and others that the pulps from which the cementing material (which is pectic in nature) has been completely removed by means of an appropriate solvent, still retain their original cellulose viscosities. Incidentally, Brauns and Lewis have described a highly purified wood pulp with 99.1% alpha-cellulose, 0.7% pentosan, 0.049 copper number, and a TAPPI viscosity of 32.1 centipoises. The analysis of the pulp indicates that almost all of the uronic acid and pentosan material has been removed. The swelling pictures show the absence of an elastic semipermeable membrane. The pulp cannot be converted by beating into a satisfactory sheet of paper, yet the pulp is highly viscous when dissolved in cuprammonium solution.

Although many other pertinent papers have appeared in the field, time does not permit their thorough discussion. It seems reasonable to conclude that, in spite of the doubt cast, solutions of cellulose in cuprammonium give viscosities which are related to the chain lengths of the various cellulose (and other polysaccharide) materials present. Inasmuch as the ratio of different chain lengths would never be the same in two pulps, the fact that pulps have the same viscosity does not necessarily mean that they are identical in physical structure. Furthermore, it has been demonstrated that the desirable papermaking characteristics of pulps are related to these chain length measurements, but again it must be pointed out that certain treatments may be given to pulps which will remove components valuable to the papermaking properties without changing the actual chain length of the cellulose components.

Much work also has been done on the physical structure of the lignin present in wood, and it has been shown that the relatively large percentage of the lignin present in the middle lamella may at times occur as a tape-like band wound around the fiber, and at other times somewhat like a banana skin, or the material may even seem to have no definite structure whatever. The middle lamella has been removed by a very laborious microprocedure by A. J. Bailey and on analysis was found to consist largely of lignin and to a much lesser degree of pentosans.

Physical and Chemical Properties of Fibers

The second subheading of the proposed program of fundamental research dealt with the physical properties of fibers, and again during the past decade a very large amount of work has been carried out in this field, in part because of the increase in interest in the colloidal chemistry of cellulose and cellulosic fibers. Many of the physical properties are purely surface characteristics. Later in this program Clark will describe a method for measuring the actual fiber surfaces present in a pulp. He and others have measured the strength of the individual fibers. Considerable work has been done to determine densities of the material in the fiber, and measurements have been made of fiber length and fiber width and the changes in these as the result of processing. This is even extended to actual measurements of changes in the dimensions of individual fibers as the result of changes in humidity. The electrical characteristics of pulps have been determined and related to the forces tending to flocculate or to deflocculate pulps; further, materials have been added to pulp suspensions to improve the deflocculating characteristics and improve formation.

The chemical properties of fibers also have been investigated very considerably. During the past ten years cellulose has been established with some certainty as a chain polymer made up of recurring molecules of cellobiose. The dimensions of the unit structures have been very accurately measured by means of X ray and the unit cell established. This does not mean that the entire subject of the chemical structure of cellulose has been determined, for there is still some uncertainty as to the nature of the end groups in cellulose, and there is even some question that the terminal sugar molecules may not possess the characteristic pyranose structure. Be that as it may, it may be said that we can view the chemical constitution of cellulose as being fairly well established.

Hemicelluloses

Work also has been done in a similar way on the hemicelluloses present in the cellulose fiber—particularly the pentosans and hexosans such as xylan and mannan, and it seems probable that these polysaccharides have structures similar to that of cellulose, and their unit cells possess dimensions of the same general order. This is particularly gratifying because it permits the use of the Staudinger constant in relating the chain length of pulps to the cuprammonium viscosity of those pulps, and this gives us some support in the

use of the term "degrees of polymerization" as calculated for pulps from viscosity data alone.

Anderson at the University of Arizona has been carrying on an important research on the structure of hemicelluloses and pectins present in wood. Within the last years, he has shown that the wood pectins are typical pectins and consist of polygalacturonic acids combined with varying members of molecules of arabinose and galactose.

Tannins

Good fundamental work on the nature of wood tannins has been carried on by Russell at the University of North Carolina, and readers who are interested are referred to an excellent review of tannin prepared by Russell in *Chemical Reviews* vol. 17, no. 2 (October, 1935). The coloring matter in western woods also has been studied, and although the answers do not yet complete the picture, it seems probable that definite progress has been made.

Lignin

The greatest amount of activity has probably occurred in the field of the structure of lignin. While we cannot say today with certainty exactly what lignin is, it may be said that we are much closer to it than was the case ten years ago, although interestingly enough the pendulum has swung back to a position taken many years ago by Klason. Actively working in the field of lignin structure are Freudenberg, Hibbert, Harris, Jahn, Brauns, and many others. The techniques which have been found most effective in helping to unravel the lignin puzzle have included:

1. The study of the ethanolysis products arising when lignin is treated with ethyl alcohol under certain conditions.
2. Quantitative measurements of the nature of the hydroxyl and other reactive groups in lignin, using diazomethane, dimethyl sulphate, etc.
3. A study of the products which result when lignin is hydrogenated under high pressure in the presence of appropriate catalysts.
4. A study of the ultraviolet absorption characteristics of lignin and lignin derivatives.

Before the structure of lignin can be established with certainty, it will be necessary that a proposed formula satisfy the results obtained by all four methods.

The great volume of work reported in this field precludes any critical evaluation. Hibbert and Freudenberg have independently presented evidence which would show lignin to be a condensation or polymerization product of building stones related in large part to phenylpropane derivatives. How they are joined together is still a matter of some conjecture. Hibbert has suggested for one mechanism that compounds

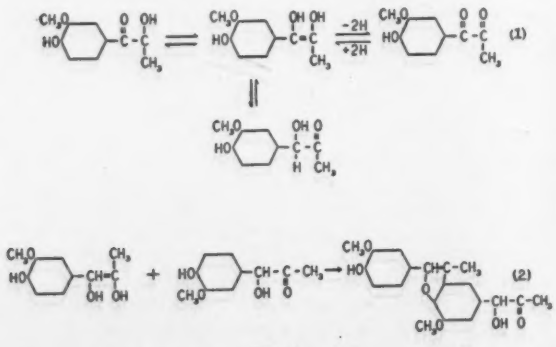


FIG. 1

such as alpha-hydroxpropiovanillone and its related syringone enolize under the influence of mild reagents; these enol forms undergo oxidation-reduction systems as shown in Fig. 1 (1)

These compounds have a strong tendency to undergo either *o*- or *p*-nuclear condensations with the formation of condensation polymers. Such would be (2) in Fig. 1.

This particular condensation yields a furane ring. Freudenberg proposes a mechanism which will yield either a 6-membered chromane ring or this 5-membered furane ring.

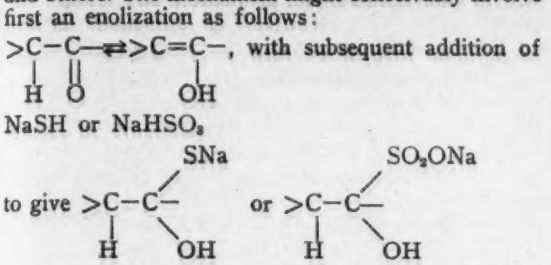
In this connection the isolation by Brauns of a soluble lignin by the action of alcohol in the absence of any polar reagents has proved to be of real value. This lignin, known as "native lignin," is almost colorless and is easily soluble in many organic solvents, as well as in the various reagents used in delignifying wood; it gives the ultraviolet absorption spectrum already set up for lignin, and it obeys the various quantitative criteria established by study of reactive groups. Native lignin has been found to have one hydroxyl group which appears to control the reactivity of the molecule. When native lignin is methylated with diazomethane, which is a reagent for the methylation of weakly acidic groups such as phenolic hydroxyls or enolic hydroxyls, the diazomethane-methylated product no longer reacts with the common reagents employed in delignifying wood such as sulphite liquor and alkaline solutions. The diazomethane-methylated lignin likewise does not react readily with chlorine. The methylated product is also white, and its color appears to be quite stable. Thus, it might be said that the various reactions of cooking and bleaching are in general associated with this one slightly acidic hydroxyl group, which appears to be located on the C-3 side chain of the lignin molecule rather than being a phenolic hydroxyl on a benzene ring.

Pulping and Papermaking Procedures

The second general heading in our original program had to do with processes such as groundwood, cooking, bleaching, stock preparation, and papermaking.

Of particular interest under this heading have been the studies made on the changes taking place in the nature of lignin as the result of cooking by the conventional procedures. Under the last section the importance of the slightly acidic hydroxyl group in lignin was noted. When this group was methylated, the product was no longer soluble in delignifying agents such as sulphite liquor, alkalies, etc. Likewise, sprucewood methylated in the same manner until the lignin has a methoxyl content of 21% will sulphonate but is not delignified by sulphite liquor. If this slightly acidic hydroxyl group be assumed to be the enolic form of a carbonyl, the above observation is greatly clarified, for work done during the past ten years has indicated that both sodium hydrogen sulphide and sodium bisulphite react with the carbonyl group in lignin to form in the first case a $>C<^{OH}_{SNa}$ and in the second place a $>C<^{OH}_{SO_2ONa}$ grouping. The former has been supported by a large amount of careful analytical work carried out by Ahlm [*Paper Trade J.*, 113, no. 13:115-118 (Sept. 25, 1941)], the latter by Haegglund, Brauns and Brown,

and others. The mechanism might conceivably involve first an enolization as follows:



The rate of delignification in cooking depends upon the rate with which the addition of the reagent to the carbonyl takes place. The greater the extent of reaction in the lignin polymer, the more soluble the derivative of lignin in the cooking liquor and the more rapid its removal from the area of delignification. Such a concept does not permit the exact formulation of the cooking reaction. In other words, it cannot be said that lignin reacts with the cooking reagent to form but one compound of definite molecular weight and definite percentage composition; rather it forms a series of compounds of gradually increasing solubility. The extent to which the reaction takes place depends in part upon the speed with which the already reactive molecules are removed, upon the relative masses of reacting substances, and upon the temperature of the reaction. Reactions occurring at low temperatures with relatively smaller amounts of active chemicals would result in the removal of lignin in a relatively uniform form. These conditions favor the actual combination of the cooking liquor with the lignin and without at the same time degrading the cellulose. At higher temperatures and with stronger concentration of active chemical, not only would we expect to get a much more complex mixture of lignin derivatives, but at the same time we might expect to find some degradation of the carboyhdrate fractions of the pulp. The lignin remaining in the pulp is that which has combined either not at all or only in slight part with the cooking chemical. The lowest sulphur content of lignosulphonic acid necessary for solution of lignin seems to be about 3.5%, which corresponds to one sulphonic group per lignin building unit.

In order to render the residual lignin in the unbleached pulp soluble, it is necessary to chlorinate or oxidize. Chlorinated lignin, because of the increase in negative characteristics of the molecule, becomes increasingly soluble in caustic. As a result, an alkaline wash following a chlorination results in the removal of a very considerable portion of the lignin. The remainder is apparently in such form as requires oxidation by means of hypochlorite.

The actual reaction between chlorine and lignin has been studied extensively both by Hibbert and his coworkers and by Larson, and it is apparent that as chlorination proceeds, there is a simultaneous demethoxylation of the lignin. The trace of lignin left in bleached pulps appears to be very low in chlorine content. Such lignin is probably so situated that it is relatively inaccessible to the bleaching agent, as in the secondary wall or in the lumen of the fiber. The lignins dissolved during bleaching have been found to be low in methoxyl content and rich in chlorine content, as was pointed out before. In other words, as chlorine enters the lignin molecule, in a position in the ring ortho to a methoxyl group, methoxyl groups are removed. The actual degree of this change depends upon the extent of chlorination. At the same time as the chlorinated lignin in these pulps is dissolved by caustic solutions, chlorine is split from the lignin. The mechanism of the change taking place during chlorination and alkali extraction would thus appear to involve the replacement of one methoxyl group in the lignin molecule by a hydroxyl group. When chlorinated pulps are extracted, it is always the lignin with the lowest methoxyl content and highest chlorine content which is removed first.

Hemicelluloses

In the past the role played by the hemicelluloses in wood has been assumed to be a purely negative one. The main purpose of cooking has been to remove the lignin and liberate the fiber. The main object in bleaching and in other chemical refining has been to remove all but the actual cellulose component of the fiber, with the thought that the most desirable fiber would be that which would possess pure cellulose as its chief chemical component. This has been proved to be wrong thinking, for the part played by the hemicelluloses has been rather thoroughly demonstrated along two directions. Firs., holocellulose (that is the entire carbohydrate fraction of the wood) has been prepared on a sufficiently large scale to investigate its papermaking characteristics. Holocellulose pulps hydrate rapidly and form transparent papers of high strength. The removal of the most soluble and most reactive fraction of the holocellulose gives pulps in high yields from which papers of very satisfactory strength have been prepared. In fact, this method of approach has shown that the normal processes used in making high alpha pulps has resulted in the loss of desirable cellulose, as well as useful noncellulosic polysaccharides, and suggests that there are better ways of preparing alpha pulps than the conventional ones. The significance of the hemicelluloses has also been demonstrated by adding to hemicellulose-poor pulps, such as rag stocks and western sulphite pulps, an amount of hemicellulosic material. This can either be pentosan such as xylan, beta-cellulose (the alkali-soluble, acid-insoluble portion of any pulp), or even hemicelluloses made by hydrolyzing or oxidizing cellulose itself. When these hemicelluloses are added to the stock in the beater, beating proceeds at a faster rate, and a sheet of higher bursting strength is formed.

Thus, there would appear to be a very definite place in the paper industry for these hitherto apparently undesirable relatives of cellulose, and one of our efforts today has been to find in nature hemicellulosic materials which can be added to pulp stocks to improve greatly such characteristics as burst, wet strength, rate of beating, and which at the same time can act as deflocculating agents, improving formation and thus improving strength. The hemicelluloses decidedly have arrived.

The author feels rather apologetic in closing with this inadequate review of a very large amount of research. The points discussed should serve as a rather clear illustration of the impossibility of ever finishing a program of fundamental research. For example, now that we begin to understand a little bit about what lignin is, the urge becomes strong to make a broad fundamental investigation involving a whole series of condensations and rearrangements analogous to many of those being employed today in

the chemical industry—likewise, in the field of hemicelluloses. Among the thousands of natural products grown in the United States and its associated countries, there must be many which would give hemicelluloses of real industrial significance—particularly to the paper industry. Their importance has only become apparent as the result of the fundamental work carried out by the organic and colloid chemists during the past ten years. Our knowledge of the location of the various components of the fiber has very definitely stimulated attempts to develop entirely new types of pulps in which the necessary reactions of fiber separation and delignification are carried out in accordance with the best fundamental knowledge.

Similar rather extensive considerations also could be given to the applications of fundamental work in fields of stock preparation, coloring, sizing, and papermaking if time permitted.

May Ship from Emergency Ports

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—OPA has ruled that manufacturers of various paper and paper products may make export shipments directly to an "emergency port" instead of the "normal port" and charge the extra freight involved.

This provision has been embodied in Amendment No. 4 to Maximum Price Regulation No. 182 (Kraft Wrapping Papers and Certain Bag Papers and Certain Bags) and in Amendment No. 13 to Maximum Price Regulation No. 129 (Waxed Paper; Envelopes; Paper Cups, Paper Containers and Liquid Tight Containers; Sanitary Closures and Milk Bottle Caps; Drinking Straws; Certain Sulphate and Certain Sulphite Papers; Certain Tissue Papers; Rope and Jute Papers; Technical Papers; Gummed Papers; Tags, Pin Tickets and Marking Machine Tickets; Glazed and Fancy Papers; Resale Book Matches; Unprinted Single Weight Crepe Paper in Folds). The amendments became effective December 28.

As a result of wartime conditions many exports are being made from emergency ports instead of normal ports of exit. Under the Revised Maximum Export Regulation the actual exporters are permitted to charge the difference in freight rates incurred as a result of congestion of ports and re-routing of shipments. Manufacturers could not pass on such extra freight charges should they ship to an emergency port rather than the normal port. To require manufacturers to ship to the normal port, and then have the exporter move the products inland to the emergency port would, in effect, increase the ultimate price paid by the purchaser as a result of the circuitous routes.

Paper Man Enters Rubber Field

MONTREAL, Que., December 28, 1942—D. W. Ambridge, well known as assistant general manager of the Ontario Paper Company, and an outstanding operating and construction engineer, has become vice-president of Polymer Corporation, Limited, a Dominion Government company which is now establishing a huge plant in Ontario for the manufacture of synthetic rubber. The plant on which many millions of dollars is being expended, is being rushed to completion by a number of Canada's largest contractors, their activities being co-related under the direction of Mr. Ambridge.

Wall Paper Restrictions Relaxed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—Provisions governing the production of wall paper have been relaxed through the issuance by WPB Director General for Operations of Schedule 1 of the General Limitation Order L-177 as amended.

Prior to this action the order, issued November 13, provided that no manufacturer could buy or put in process paper stock in excess of 50 per cent of the total tonnage of such stock used by him in the production of wall paper in the period July 1, 1941 to June 30, 1942.

Through a number of adjustments, the order as amended in effect raises this quota to an industry-wide figure of 60 percent. This action was taken because, by the time the necessary simplification standards had been worked out for the original order, four and a half months of the production season had passed. As a result, many manufacturers already had used up more than four and a half months' worth of their quota.

The industry is now permitted to operate, mill by mill, from November 13 of this year to January 15 of next year on the basis of consuming 64 percent of the tonnage of each such mill in the same period of the previous season; and to operate from January 15 to June 30 on the basis of 50 percent of last season's production for that period. This will produce for the entire period, a curtailment to 60 percent.

Would Reduce Magazines 10 Per Cent

WASHINGTON, D. C., December 30, 1942—WPB has received a recommendation of a flat 10 percent reduction in the amount of print paper to be used by each magazine publisher in 1943 as compared with 1942 made by the Magazine Industry Advisory Committee at a meeting with officials of WPB's Printing and Publishing Division in Washington. The committee made no recommendation as to how the individual publisher might effect the reduction if the consumption of print paper is curtailed.

Reason for the committee's recommendation is that the pulp wood supply available for 1943 is estimated to be 20 million cords in North America, including Canada. Current consumption is at the rate of approximately 25 million cords annually. The cut in availability of wood, however, does not necessarily indicate a proportionate cut in the supply of print paper, because of the inventory situation and other factors.

The action of the magazine committee was in line with a recommendation submitted to WPB on Thursday, December 10, by the Newspaper Industry Advisory Committee. This committee recommended that, with various modifications and the right of appeal, newspapers be limited during 1943 to the same amount of print paper they consumed in 1941.

J. P. Lewis Co. Gives Checks

BEAVER FALLS, N. Y., December 28, 1942—This year again all employees of the J. P. Lewis Company including those at their mills in Beaver Falls, N. Y., and those in their various sales offices and additionally all employees who are now in the armed services, received Christmas checks in accordance with the custom of this company in recent years.

IMPORTS OF PAPER

NEW YORK IMPORTS

WEEK ENDING DECEMBER 26, 1942

SUMMARY

Newsprint .....1,981 rolls

NEWSPRINT

World Telegram, ——, ——, 174 rolls.
N. Y. Sun, ——, ——, 493 rolls.
U. S. Paper Mills, ——, ——, 480 rolls.
Clinton Paper Corp., ——, ——, 418 rolls.
International Paper Sales Co., ——, ——, 416 rolls.

WOOD PULP

——, ——, ——, 1016 bls. unbleached sulphite.

GLUE STOCK

——, ——, ——, 150 bls.

Asks New Trial in Pollution Case

SHREVEPORT, La., December 19, 1942—A motion for a new trial has been filed in the Federal Court by the International Paper Company, successor to the Southern Kraft Corporation protesting a judgment against them in favor of Ernest Maddox, fishing camp proprietor on Bodcaw bayou, in connection with pollution of the bayou by waste from the concern's mill at Springhill.

Federal Judge Gaston L. Porterie ruled Dec. 11, that there be a judgment of $6,000 filed for Maddox against the paper company, for damages to his business for 1940, 1941 and 1942. Testimony showed that a large amount of fish were killed and water rendered unfit for fishing when waste released from the paper company's flood gates flowed directly into Bodcaw bayou at several intervals starting in the fall of 1939.

In the original trial the judge commended the paper company on its good faith and attempts to prevent the stream's pollution, but said that did not constitute a defense to award of damages to Maddox.

Attorneys of International Paper Company said the motion for a retrial will be ready for a hearing by Jan. 19, 1943.

Indexes of Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—Indexes of the value of paper manufacturers' and allied products inventories, using the average month of 1939 at 100, was 149.6 in October, as compared with 154.6 for September, and 128.5 for October of last year, according to the monthly industry survey of the Department of Commerce.

Paper manufacturers' shipments indexes for October was 148, using 1939 average month at 100, while the September index was 136, and the October, 1941, index was 169.

Paperboard industrial production index for the month of November was 137, adjusted for seasonal variation and using the 1935-39 average at 100, according to a report of the Federal Reserve Board. The October index for paperboard was 128, and the index for November of 1941, 167. Without seasonal variation adjustment, indexes for paperboard were, for November, 137; for October, 136; and for the previous November, 167.

Paper and products indexes for October, with seasonal variation, was 134; and for the month of November, 1941, 153. Without seasonal adjustment, the latter were indexed at 139 for October and 152 for November of 1941, the figures for the current November not yet available.

Newsprint production indexes for October, with seasonal variation, was 107; and for the month of November, 1941, 110. Without seasonal adjustment, the latter was 107 in October, and 113 for the month of November, 1941.

Kieffer Mills Sign Up for War Bonds

The Kieffer Paper Mills, Brownstown, Ind., announce that all their employees, including officers, and office force, are, effective January 1, enrolled in the 10% payroll deduction plan for War Savings Bonds. A number of the employees were already following this plan before the drive and the rest of the employees were signed up within 48 hours making the plant a 100% proposition.

The employees through a fund raised monthly are sending the former employees now in the armed forces a package of articles they think will be appreciated, which they are, according to all reports and from letters received by the company.

Approximately 40% of the plant's entire production is going directly to all out war producers and it is estimated that 20% is going into war products which cannot be accounted for. At least 75% of the total production consists of moulded "Shoksorb," cushioning papers and finished paper products on which the firm has a steady diversified market, as is evidenced in letters from former employees who are now in the Armed Service in Bermuda, Africa, Pearl Harbor and the Solomons to the effect that they have seen "Shoksorb" when unpacking articles in these different countries.

A new development in this specialty line of importance last year was an all "Shoksorb" furniture packing pad which, however, is being used by many other industries because it is entirely free of foreign matter of different kinds, as the standard pad consists of simply three strips of light weight "Shoksorb" of different designs so they will not nest, all enveloped in a No. 1 Kraft wrapper. This pad is patented. Business on this item is constantly increasing.

The company has for a number of years been paying a bonus to all hourly employees on December 24. This year, however, a bonus has been paid quarterly and for the fourth quarter of 1942 a bonus will be paid of 10% on the wages earned in this quarter. The foremen and office force in the different departments were paid a substantial bonus also on December 24.

The mill is operating to capacity although December is always considered a rather poor month, especially the last half. Business this month has been better than the previous month.

Uruguay Limits Newspaper Size

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 30, 1942—Newspapers in Uruguay may not publish editions containing more than 12 pages, with 14 pages being permitted if advertising matter exceeds the space occupied by 30 columns, according to a report to the Commerce Department.

They may publish only one weekly supplement of 8 pages, or 16 pages if of tabloid size, or two weekly supplements if these take the same amount of paper.

New York Paper and Pulp Market Review

Demand for Major Grades of Paper Continues Heavy With Deliveries Becoming More Difficult—Pulp Market Rather Quiet On All But High Grades of Bleached Pulp—Waste Paper Slow.

Office of the PAPER TRADE JOURNAL
Wednesday, December 30, 1942.

Demand for a wide variety of papers and some specialties, continues to appear in reports received from many manufacturers' representatives, jobbers, and general paper merchants this week. The problem of making deliveries, due to labor shortage, is apparently steadily becoming more serious. The manpower supply situation is, of course, apparent in all industries and trades.

The index of general business activity for the week ended December 19 was fractionally higher at 135.0%, compared with 134.5% for the preceding week, and with 134.7% for the corresponding week last year. Paper board production was 6.0% lower.

Paper production for the week ended December 19 was estimated at 86.8%, compared with 107.3% for 1941, with 90.9% for 1940, with 97.2% for 1939, and with 75.9% for the corresponding week for 1938.

Paper board production for the week ended December 19 was 95.0%, compared with 101.0% for 1941, with 80.0% for 1940, with 81.0% for 1939, and with 75.0% for the corresponding week for 1938.

Recent price interpretations issued by the OPA, refer to Maximum Price Regulation 130, Standard Newsprint Paper. The price determination states that no extra charge for less than a carlot and waterlining treatment. The only additions a manufacturer may add to maximum prices are those specified in Section 1347.282. Adifferential may not be added to the maximum price for deliveries in less than a carlot, or for waterlining treatment.

Wood Pulp

The chemical wood pulp market is reflecting the expected WPB curtailment order which may reduce paper production by as much as 25% under the output of 1942. The increasing labor problem, as workers leave for the Armed Forces and are diverted to defense plants, is quite generally regarded as the basic factor. Current reports indicate that many mills are reducing rather than adding to their pulp inventories.

Rags

Mill buying of new cotton cuttings is less active at this date, reflecting the usual year-end inventory situation. Prices are firm, under the influence of somewhat limited supplies. Roofing rags are firm at ceiling prices.

Old Rope and Bagging

Demand for old No. 1 Manila rope continues steady, with the ceiling price of $115 per ton maintained.

Slow trading continues to be reported in old bagging. The roofing grades are firm.

Old Waste Paper

The old waste paper market reflects the year-end inventory period and is relatively quiet at this date. Prices are firm, with no important changes reported at this date.

Twine

The twine market is rather quiet this week. Prices are firm and unchanged on major grades of hard and soft fiber twines.

Never Late or Absent in 59 Years

LEE, Mass., December 20, 1942—Fifty-nine years is a long service record to hold with one firm, but when one has never been late nor absent from his job in all those years it really stands out as a record. This is the achievement attained by Patrick L. O'Connell of this town before his recent retirement from Smith Paper, Inc. On the day of his retirement he was the recipient of a personal letter from Walter F. Tatum, general manager of the concern, praising him for his outstanding record of service with the company. His multitude of friends and coworkers, both men and women, tendered him a surprise party at the Here-U-R inn in the evening.

At the age of 15, Mr. O'Connell began working at the Columbia mill of Smith Paper under the late Alex McAlpine. This was in 1883 and eight years later he was put in charge of the ragroom, where he continued as foreman for 35 years. During his long service with the company he has witnessed many changes in methods of manufacture, personnel and equipment. When he began his duties with the firm, manila paper was manufactured. The output was changed to the manufacture of cigarette, carbon and Bible papers in 1894.

In 1883 Wellington Smith Sr., was president of the then Smith Paper company. About 10 or 12 years ago the five mills of the company were purchased by the British-American Tobacco company and the firm name changed to that of Smith Paper, Inc. In the last year paper has been shipped to China, Russia, South America, Africa and other distant points of the compass.

For 72 years Mr. O'Connell lived in the family homestead which was built in 1865 by his father on East street. Following the death of his sister a few years ago, he went to live with another sister, Mrs. James Whalen, on East Senter street.

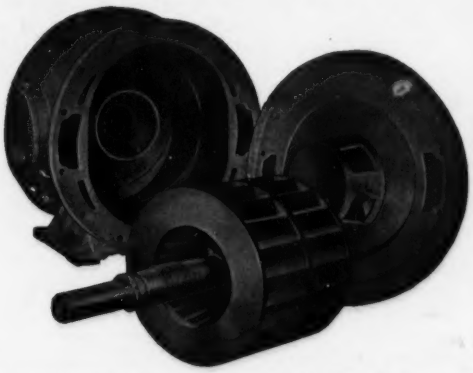
Heads Travelers Aid Drive

Charles J. Slicklen, vice-president of Charles F. Hubbs & Co., 383 Lafayette street, New York, has accepted the chairmanship of the Paper Industry Committee, in the current financial appeal of the Travelers Aid Society.

The society, which has been assisting stranded, under-privileged and unfortunate people for forty years, has not before made a general appeal to the paper industry. It has now been transformed to a war-time organization, caring for Service Men and civilians and their families.

Checks for this worthy cause may be made out to the Travelers Aid Society and sent to Mr. Slicklen.

SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

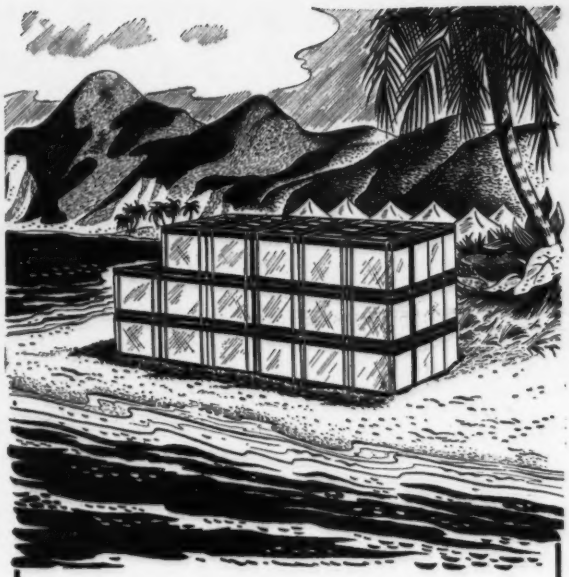
NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

More than just a TRADE MARK

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

BUT also a guarantee by men who for 78 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

KNOX WOOLEN CO.
CAMDEN, MAINE.



Wharf...

SOUTH PACIFIC STYLE

Nopco salutes the paper box industry on the great job being done in the manufacture of cartons for shipment of supplies from America to Pacific ports where dock facilities just aren't.

These cartons must and do have sufficient durability and water resistance to stand being thrown overboard into the sea without damage to their contents.

Nopco is proud of the part it is playing in serving the paper box industry with waterproofing agents and gladly offers its cooperation in this and many other paper production problems.

NOPCO
REG. U.S. PAT. OFF.
"EVOLVED THRU RESEARCH"

NATIONAL OIL PRODUCTS CO.
Paper Chemical Manufacturers
HARRISON, N. J.
Boston Cedartown, Ga. Richmond, Cal.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, December 30, 1942.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b. works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Current demand reported active. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are unchanged for the week. Standard domestic casein, 20-30 mesh, is quoted at 19 cents per pound; 80-100 mesh at 19½ cents per pound; all prices in bags, car lots. Argentine casein, 20-30 mesh is currently quoted at 9 cents per pound, c.i.f. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are reported unchanged. Supplies ample. Demand fair for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o. b. works.

ROSIN—Quotations on some grades of rosins are lower for the current week. "G" gum rosin is currently quoted at $3.42 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.40 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.63 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported moderate for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt sake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand good. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH — Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported light. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.80	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Lt. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.08 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.80
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.20
No. 4 Glossy Coated	11.15	"	12.70
No. 1 Antique (watermarked)	10.25	"	11.70
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	64.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	62.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	8.00	@	8.25
Silesias No. 1	4.50	"	4.75
New Unbleached	8.00	"	8.25
Blue Overall	5.75	"	6.00
Fancy	3.00	"	3.25
Washables	2.50	"	2.75
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

ENGLISH ECCO CLAYS CLAYS

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

TAKE YOUR CHOICE

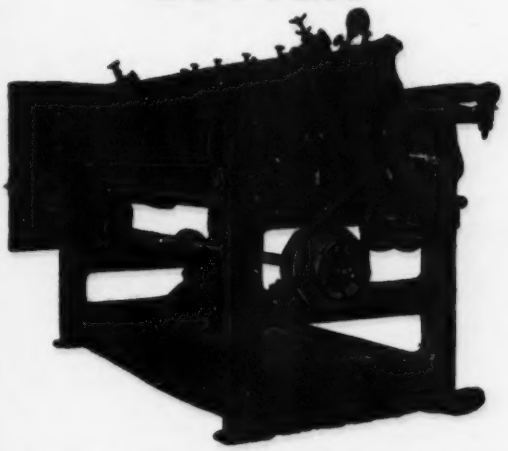
Cameron makes both score and shear cut slitting machines. With both types to choose from you can count on our unbiased counsel in picking the machine best suited to your job. Heads or tails, you win both ways.

CAMERON MACHINE COMPANY, 61 Poplar St., Brooklyn, N. Y.

CAMACHINE

MODEL 28

ROLLER BEARING CUTTER



HAMBLET MACHINE CO.
LAWRENCE, MASS.

MAKERS OF

SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS
CUTTER KNIVES, PATENT TOP SLITTERS.

WATERBURY FELTS

Are Made By

H. WATERBURY & SONS CO.
ORISKANY, NEW YORK

Mill Cogs

ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

READY TO RUN

the moment driven and keyed. Write at once for circular "G" and instruction sheets free.

THE N. P. BOWSHER CO.
South Bend, Ind.
Established 1882

Old Rags

White, No. 1—			
Repacked	*1.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All prices nominal
New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)
OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env, & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old Kraft Corrugated Containers	1.50	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¾	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¼
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¾	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¼	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)
OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)
OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.50	@	4.00
Sisal Rope	4.50	"	4.75
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.75	"	5.25
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.50	"	3.75
Scrap Sisal	4.50	"	4.75
Scrap Sisal for Shredding	—	"	.04¾
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.75
Aust. Wool Pouches	5.10	"	5.25
New Burlap Cuttings	5.00	"	5.25
Heavy Baling Bagging	4.25	"	4.75
Paper Mill Bagging	2.75	"	3.00
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¼	"	.06½
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06	"	.06½
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

INDIANAPOLIS
BLIC LIBRAR

PAPER TRADE JOURNAL

DECEMBER 31, 1942

Geigy
Dyestuff Makers Since 1859

With that relentless taskmaster "Production" pressing, pressing, pressing, there were many occasions during 1942 when even the Patience of Job would have been tried.

It must be said that the kindness, consideration and cooperation exhibited by you made seemingly insurmountable barriers vanish—

And it was just that kind of thoughtfulness that we, also, had a difficult job, which makes us eternally grateful not only for the business with which we were favored but for the peace of mind which you gave us in the process of serving you.

Our wish is for your good fortune in 1943.

Geigy Company Inc.

DOWNINGTOWN

HOW WILL THE STUFF BE FED ONTO THE 5000 F.P.M. PAPER MACHINE

Will the stuff be **PUMPED** at high velocity **ONTO THE WIRE** part of the machine . . .

or will it be **SPRAYED** at high pressure **ONTO** some entirely different type of wet end or **FORMATION UNIT**

Will some **CHEMICAL** be **ADDED** to the water to **HASTEN** its **PRECIPITATION** or **EVAPORATION** . . .

or will some **CHEMICAL** be used **INSTEAD OF WATER** —if so, will this chemical **PROVIDE FREENESS** for the felting of fibres with a **LOWER PERCENTAGE** of **LIQUID**

FRANKLY, we don't know the answer, but in these days when nothing is impossible* we're thinking . . . and planning . . . and we would be most interested in any ideas you may have, no matter how fantastic they may seem. Write our "Vice President in Charge of Making the Impossible Possible" . . . and remember, if you are worried about how to prolong the life of your present equipment or how to make it produce more, our engineers are at your service. The Downingtown Mfg. Co., Downingtown, Pa.

D

*Remember, flying an airplane weighing 82 tons was considered impossible a few years ago.

DELIVERING FOR DEFENSE TODAY—DEVISING DEVELOPMENTS FOR TOMORROW